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# Clean Technology in Los Angeles

Improving the City's Competitiveness

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## Executive Summary

In an effort to revitalize its economy, protect the environment, and help create new jobs for its middle-class, the City of Los Angeles's leadership has been actively looking for ways to help make Los Angeles a global leader in the research, development, production, and application of clean technologies. Driven by one of the most aggressive climate action plans of any large city in the U.S. (GREEN LA), the nation's largest solar project (SOLAR LA), three of the world's top research universities, and the country's largest manufacturing center, the City of Los Angeles contains the necessary supply and demand to develop a thriving cleantech cluster in the region. Although several measures indicate that the Los Angeles region is emerging as a significant employment and activity center for cleantech, the City has yet to realize the "green" job and firm creation it desires.

One reason why is because Los Angeles is not alone in its desire to become the "Silicon Valley" of Cleantech. With millions of dollars and thousands of future jobs at stake, many major metropolitan cities across the U.S. are also targeting their economic development efforts towards this rapidly emerging sector. Near record levels of unemployment—especially in the manufacturing sector—and growing public and private investments in cleantech have also increased competition between cities across the country.

The usual tech-savvy players—San Francisco, San Jose, Seattle, and Boston—currently lead the way in cluster development, but strategic investments and planning by Austin, Portland, New York, Denver, Detroit, San Diego, Sacramento, and Houston have also firmly placed those cities on the cleantech map. Despite its efforts, Los Angeles is not perceived as being a leader in cleantech. The City is continually facing greater competition to become the hub of clean technology in the U.S. and regularly loses desirable firms to other cities within the state and throughout the nation.

This report assesses Los Angeles's strengths and competitiveness in attracting, retaining, and growing cleantech firms by comparing it to the aforementioned competitor cities on the following seven business placement factors: workforce characteristics, land & facilities, business environment, financing & funding access, industry clustering, transportation systems, and quality of life. Our research indicates that Los Angeles has comparative strengths in its sizeable workforce, industrial land, and easy connections to and from global shipping and air hubs. Assets aside, attracting

cleantech businesses to the City of Los Angeles is difficult because of comparative disadvantages, including: expensive land and facilities, an unfriendly and bureaucratic business environment, and the high cost of living.

In addition to measuring Los Angeles and its competitor cities on these seven business placement factors, we surveyed each city's economic development programs, especially those designed specifically for cleantech companies. This process revealed substantial gaps in the programs and incentives available to cleantech companies in Los Angeles. Most of the competitor cities we examined administer economic development programs that are substantially more developed, innovative, and targeted than those in Los Angeles.

To address the City of Los Angeles's weaknesses and gaps with respect to cleantech, we identified specific economic development programs and incentives used by our competitors. We cited the following policy options, organized by the gaps that they seek to address:

<i>WORKFORCE:</i>	Cleantech Industry Skill Panels
<i>LAND &amp; FACILITIES:</i>	Property Tax Abatement
<i>BUSINESS ENVIRONMENT:</i>	Cleantech Business Assistance Center Local Purchasing Preference Enhanced Economic Development Website and Online Tools
<i>FINANCING &amp; FUNDING:</i>	Revolving Loan Fund
<i>INDUSTRY CLUSTERING:</i>	Enhanced Regional Cleantech Network Demonstration Projects Cleantech Incubators Cleantech Focused Staff and Expedited Permitting Service

Our analysis took into consideration each incentive's financial impact on the City's general fund, the ease and feasibility of adoption, and the type of resultant benefits that these programs provide to cleantech firms. We do not offer specific

recommendations on how the City can adopt any particular incentive, but rather, we provide an overview of options for the City to employ as needed. We do, however, find the following options most feasible for quick adoption, given their low financial impact and relative ease of implementation: cleantech industry skill panels, a more robust economic development website, a strong partnership with a regional cleantech network, and demonstration projects.

It is important to note that these economic development tools must be addressed in the framework of a much broader cleantech development strategy. These options address particular weaknesses in Los Angeles, and must be combined strategically with other incentives to increase the City's overall competitiveness. Finally, proactive efforts to facilitate inter-firm interaction and to work closely with cleantech firm owners are critical to building a strong industry cluster. Careful implementation is necessary for Los Angeles to develop the cleantech sector as a source of long-term growth.

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## Introduction

As stated in his second inaugural address, the creation of green jobs, attraction of cleantech companies, and the “greening” of the city remain Los Angeles Mayor Antonio Villaraigosa’s top priorities.<sup>i</sup> In pursuit of these goals, the Mayor’s Office of Economic and Business Policy (OEBP) and the Community Redevelopment Agency of Los Angeles (CRA/LA) are working to bring leading cleantech firms to Los Angeles. Up to this point, each new lead or inquiry to the department or agency by a suitable firm has resulted in an untested package of custom incentives. More often than not, the firms have decided to locate in another city.

Our clients want to better understand what incentives competing cities are offering to cleantech firms, how Los Angeles’s incentives compare, and what, if any, new incentives the City should offer in order to increase its competitiveness as a site for cleantech firm location. To this end, we analyzed common factors that businesses look at when determining where to locate, surveyed the competitive landscape, analyzed Los Angeles’s relative strengths and weaknesses, and recommended policy options targeted towards improving Los Angeles’s competitiveness.

## Clients

This report was prepared for OEBP and CRA/LA. OEBP is the department within the Mayor’s Office that develops and oversees Los Angeles’s economic development policies and programs. In addition to creating the Mayor’s cleantech strategy, OEBP also often serves as the City’s first point of contact and primary negotiator for cleantech firms that are considering locating in Los Angeles.

As the city’s redevelopment authority, CRA/LA seeks to eliminate blight, create jobs, develop the local economy, and expand the city’s affordable housing supply while attracting investment into neglected areas of Los Angeles. A substantial portion of the

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<sup>i</sup> For the purposes of this paper, “attraction” indicates the city’s ability to foster business formation, retain firms currently located in the Los Angeles region, and capture major firms looking to relocate. “Attraction” should be thought of as a themaking of a City more attractive to business.

City's cleantech designated area (Cleantech Corridor) and related projects reside in the CRA/LA's Central Industrial Project Area. Therefore, the CRA/LA is the lead agency tasked with implementing the City's cleantech strategy, which includes purchasing and remediating a twenty acre plot of land called the CleanTech Manufacturing Center (CTMC) and planning a cleantech incubator.

## What is Cleantech?

There is no widely-accepted definition of cleantech. However, for the purpose of the paper, we use the definition provided by the Cleantech Group, a San Francisco based organization credited with originating the term.<sup>1</sup> According to the Cleantech Group, cleantech represents a diverse range of products, services, and processes, all intended to provide superior performance at lower costs, while greatly reducing or eliminating negative ecological impact, while at the same time improving the productive and responsible use of natural resources."<sup>2</sup>

The term "cleantech" does not identify one specific industry; instead, the term is used to encompass a wide variety of energy efficient and renewable technologies that are applied to various traditional industries. The federal government uses the North American Industry Classification System (NAICS) and Standard Occupational Codes (SOC) to classify and categorize business and employee data throughout the country. Since cleantech spans many industries, and because cleantech is a relatively new sector, there are no specified NAICS codes for cleantech specific industries, and SOC categories do not disaggregate workers in the cleantech sector from those in other industries. As a result, we rely primarily on private groups like the Cleantech Group to quantify the size of these industries.

Table 1 lists eleven traditional industries with examples of new clean technologies and products that are being developed in each of these industries.

**TABLE 1. CLEANTECH SUB-SECTORS**

<b>Energy Generation</b> <ul style="list-style-type: none"> <li>• Wind</li> <li>• Solar</li> <li>• Biofuels</li> </ul>	<b>Energy Storage</b> <ul style="list-style-type: none"> <li>• Fuel Cells</li> <li>• Advanced Batteries</li> <li>• Hybrid Systems</li> </ul>	<b>Energy Infrastructure</b> <ul style="list-style-type: none"> <li>• Management</li> <li>• Transmission</li> </ul>
<b>Energy Efficiency</b> <ul style="list-style-type: none"> <li>• Lighting</li> <li>• Buildings</li> <li>• Glass</li> </ul>	<b>Transportation</b> <ul style="list-style-type: none"> <li>• Vehicles</li> <li>• Structures</li> <li>• Fuels</li> </ul>	<b>Water &amp; Wastewater</b> <ul style="list-style-type: none"> <li>• Water Treatment</li> <li>• Water Conservation</li> </ul>
<b>Air &amp; Environment</b> <ul style="list-style-type: none"> <li>• Cleanup/Safety</li> <li>• Emissions Control</li> <li>• Offsets</li> </ul>	<b>Materials</b> <ul style="list-style-type: none"> <li>• Nano</li> <li>• Bio</li> <li>• Chemical</li> </ul>	<b>Manufacturing</b> <ul style="list-style-type: none"> <li>• Advanced Packaging</li> <li>• Smart Production</li> </ul>
<b>Agriculture</b> <ul style="list-style-type: none"> <li>• Natural Pesticides</li> <li>• Land Management</li> </ul>	<b>Recycling &amp; Waste</b> <ul style="list-style-type: none"> <li>• Recycling</li> <li>• Waste Treatment</li> </ul>	

Though the definition of cleantech is broad, the City may benefit by focusing on particular areas within cleantech to craft a targeted economic development approach. We place some emphasis on solar power and electric vehicle manufacturing to Los Angeles's relative strengths in these cleantech areas. Please see Appendix 1.5 for more information regarding this methodology.

## Los Angeles's Key Competitor Cities

Citing the potential for job creation—and more specifically, “green jobs”—many U.S. cities have unveiled aggressive business attraction strategies for cleantech firms. Furthermore, the current economic recession has compounded the importance of a cleantech economic development strategy in these cities. Our client, based on their own research and interviews with cleantech firms, identified the following twelve cities as cities Los Angeles often competes with to attract cleantech businesses.

**TABLE 2. LA'S COMPETITOR CITIES**

Austin, TX	Portland, OR
Boston, MA	Sacramento, CA
Denver, CO	San Diego, CA
Detroit, MI	San Francisco, CA
Houston, TX	San Jose, CA
New York, NY	Seattle, WA

The cities and regions above are also identified as twelve of the top fifteen cleantech activity centers by Clean Edge, a leading research and publishing firm devoted to the cleantech sector.<sup>3</sup> Four of these competitors are in California, three elsewhere in the West, and the remainders are located in the Midwest and East.

## Business Placement Factors

When deciding where to locate, decision makers within companies compare different cities or regions on a range of factors. These factors determine the success of various components of a business plan, but can also depend on an entrepreneur's personal preferences. In order to craft a successful business attraction strategy, cities need to understand their strengths and weaknesses in each of these factors. A city government cannot account for personal preferences, but they do have control over factors that can increase its general attractiveness as a place to do business.

A thorough literature review<sup>4</sup> revealed a common set of factors most frequently assessed by businesses when comparing regions for relocation or expansion. We will henceforth refer to these factors as "business placement factors". The set of factors that is most representative of the sample is from Development Counsellors International (DCI), a consulting company that helps regions market themselves for economic development purposes. Since 1996, DCI has conducted five surveys of corporate executives with site selection responsibilities to understand what they look for when locating a business.<sup>5</sup> We refer to DCI's 2008 report, "A View From Corporate America: Winning Strategies in Economic Development Marketing," as the basis for the seven business placement factors that we use to analyze the attractiveness of Los Angeles and its competitor cities. These seven factors are: workforce, land and facilities, business environment, financing and funding, industry clustering, transportation methods, and quality of life.

While these factors are consistent across numerous surveys for general business, we were unable to isolate a cleantech-specific set of factors. The range of industries and firms within the cleantech sector has a diverse set of needs that are no more or less likely to be met by different factors. Furthermore, these factors are not ranked by level of importance.

We measured how Los Angeles performs on the seven business placement factors by choosing metrics from public sources (e.g. Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis) and private sources (e.g. Kiplinger Research, Clean Edge, Forbes). We use this information to develop a gap analysis of Los Angeles's strengths and weaknesses on these business placement factors compared to its competitor cities. For each factor, we define the factor, identify the metrics and data sources used to measure these factors, and explain our gap analysis.

## Business Placement Factor #1: Workforce

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

The availability and skill-level of a local workforce are essential to a business's understanding of the region's labor market. When relocating or starting a business, an entrepreneur assesses their short-term and long-term hiring capacity and labor needs, and the ability of a region's workforce to meet this demand.<sup>6</sup> Cleantech companies employ people in occupations ranging from installation and assembly to engineering and research. For example, a cleantech firm might need employees for manufacturing positions that require a high school or associate degree (e.g. assembler, system installer, sheet metal worker).<sup>7</sup> The same firm might also need professional or technical services workers that require a bachelor's degree or higher (e.g. electrical engineer, business analyst, or research associate).<sup>8</sup> As a result, an abundant diversified workforce is a key factor in business location.

### *METRICS AND DATA SOURCES*

Our team identified a number of metrics to compare the labor pool in these cities in order to identify the concentration of cleantech occupations in each of the cities, and the average wages of these occupations. We used 2008 data from the Bureau of Labor Statistics (BLS) to find the total number of people employed in the manufacturing and professional and technical services sectors.<sup>ii</sup> We used 2008 Bureau of Economic Analysis data to find the gross domestic product output in the two sectors. These metrics demonstrate the importance of the manufacturing and professional/technical services sectors to the local economy in terms of economic output and local employment; this sends a signal to a company that their business would be near suppliers and that the workforce would be capable of meeting their labor requirements.<sup>9</sup>

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<sup>ii</sup> There were a few instances where the 2008 BLS data did not include information on particular MSA's regarding our identified metrics. In these cases, we used either 2002 Economic Census data or 2006 Bureau of Economic Analysis data. In these instances, we have noted the varying data source with asterisks and notes at the end of the table.

We also use data from the Quarterly Census of Employment and Wages (QCEW) and Occupational Employment Statistics (OES) to collect wage data for the particular industries (NAICS) and occupations (SOC) that are relevant to the cleantech sector.<sup>iii</sup> We include a few examples of occupations in the table below; detailed information on all of the relevant occupational categories and industries can be found in Appendices 3.8 and 3.9.

Finally, we use the Census Bureau's American Community Survey data to determine the percent of the population in these regions with a Bachelor's degree or higher. Firms that require both low and high skilled labor need a measurement of the region's educational attainment. A region with a high proportion of college-educated residents in its workforce has a stronger pool of skilled labor from which to hire.

These metrics are important because companies assess the size, education levels, and wage rates of a region's workforce to determine if their short-term and long-term employment needs will be fulfilled in a region. The table below identifies each of these metrics in Los Angeles and its competitor cities, and a more detailed version can be found in Appendix 3.2.

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<sup>iii</sup> We used a list of industry (NAICS) and occupation (SOC) codes that are relevant for the cleantech industry from a list created by the California Community Colleges Centers of Excellence. [www.coeccc.net/green](http://www.coeccc.net/green)

**TABLE 3. WORKFORCE METRICS<sup>iv</sup>**

Least Attractive		Less Attractive		Median		More Attractive		Most Attractive	
	Manufacturing GDP '08 (in millions) <sup>10</sup>	Prof/Tech Services GDP 2008 (in millions) <sup>11</sup>	Total # of Manufacturing Workers <sup>12</sup>	Total # of Prof/Tech Services Workers <sup>13</sup>	Assemblers Mean Annual Wage <sup>14</sup>	Elec. Engineers Mean Annual Wage <sup>15</sup>	% Bachelor's or higher <sup>16</sup>		
Austin	\$10,347	\$7,940	58,089	58,100	\$25,050	\$98,530	39.55%		
Boston	\$25,984	\$41,061	199,200	183,500	\$29,130	\$101,630	45.31%		
Denver	\$20,109*	\$15,250**	90,371*	102,900	\$26,850	\$82,120	37.97%		
Detroit	\$28,609	\$21,116	233,624	166,400***	\$29,160	\$80,420	28.49%		
Houston	\$58,753	\$32,034	240,792	185,800	\$23,050	\$95,340	28.46%		
Los Angeles	\$69,007	\$65,512	605,391	386,500	\$24,390	\$88,680	30.86%		
New York	\$62,455**	\$124,852	466,900***	679,700	\$24,800	\$90,910	37.98%		
Portland	\$23,209	\$7,175	122,867	54,300	\$28,540	\$86,640	34.07%		
Sacramento	\$4,033	\$7,881	38,002	55,700	\$27,210	\$109,950	31.24%		
San Diego	\$12,879	\$16,943	102,258	114,600	\$24,770	\$94,250	35.04%		
San Francisco	\$30,861	\$43,398	135,330	211,400	\$29,780	\$92,900	45.55%		
San Jose	\$25,231	\$20,894**	167,729	112,800***	\$28,240	\$105,570	45.68%		
Seattle	\$22,226	\$16,675	185,348	108,800	\$30,880	\$82,860	37.88%		

<sup>iv</sup> In some cases, BLS and BEA did not have data for some cities. In those cases, we tried to get the best comparable numbers from other government sources. Any number with a \* next to it was retrieved from 2002 Economic Census data. Any number with \*\* was retrieved from 2006 Bureau of Economic Analysis data. Any number with \*\*\* was retrieved from 2006 Bureau of Labor Statistics data.



## *GAP ANALYSIS*

Los Angeles is the leading center of manufacturing output, contributing \$69 billion to gross domestic product and employing the most people in manufacturing occupations (605,391).

Los Angeles's manufacturing base is more diversified than the petrochemical manufacturing in Houston, electronic manufacturing in San Jose, and automobile manufacturing in Detroit. However, the majority of Los Angeles's manufacturing employment is in low-skill and low-wage manufacturing like metals, apparel, and food.<sup>17</sup> General assembly-line manufacturing workers ("team assemblers") and electrical and electronic equipment assemblers are paid lower wages in Los Angeles than all competitor regions aside from Houston and Austin. Cleantech manufacturing jobs can require higher skills, and, as a result, pay better wages than some of the traditional manufacturing jobs in Los Angeles.<sup>18</sup> To the local workforce that has witnessed a 10.83% decline in manufacturing employment over the last five years, cleantech jobs represent the ability to obtain higher paying employment (see Appendix 3.10). To cleantech companies, this represents competition for the higher-paying manufacturing jobs that they would offer.<sup>19</sup> However, in order to get these jobs, the manufacturing workforce needs to obtain the skills necessary for these jobs.

As far as professional and technical services, Los Angeles is well-positioned to provide the needs of cleantech companies. Los Angeles employs the second highest number of professional and technical service workers. Compared to other regions, the percentage of the population in Los Angeles with a bachelor's degree or higher (30.86%) is lower than the median in the group (Seattle 37.88%). Despite the proportional lack of education, the absolute number of people with bachelor's degrees is higher in Los Angeles than in any other region. However, this means that Los Angeles also has the most people without college degrees. Again, this has serious implications for the need of training and development for the workforce that does not have a college degree or formal workforce training.

Los Angeles has high employment in industries relevant to solar and electric vehicle manufacturing, such as semiconductor and vehicle manufacturing. With over 29,000 employees in the semiconductor manufacturing industry, San Jose is the front-runner in this field. Austin is second with 12,478 employees; Los Angeles ranks third with 8,799 employees in semiconductor manufacturing. However, in both San Jose and Austin, semiconductor manufacturing is a substantial contributor to the local manufacturing economy (17.33% and 27.43% of manufacturing, respectively). In Los Angeles, the 8,799 employees in semiconductor manufacturing represent only 1.45% of local manufacturing employment. Similarly, Los Angeles ranks third in employment in transportation equipment manufacturing (65,996 workers), with Detroit ranking first (99,947) and Seattle ranking

second (86,492). Again, the transportation equipment employment only represents 10.9% of the local manufacturing base in Los Angeles, while it represents 42.78% of manufacturing in Detroit and 46.66% of manufacturing in Seattle.<sup>v</sup>

## Business Placement Factor #2: Land & Facilities

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

The availability, cost, and types of property in a locality contribute to a business's decision to locate there. Cleantech companies typically operate on property that is zoned for industrial or manufacturing uses.<sup>20</sup>

### *METRICS AND DATA SOURCES*

We identified data regarding vacancy rates on industrially zoned land, the amount of land that these vacancies represent, and the price per square foot of this land in all of these regions. The data come from commercial real estate services firm Cushman & Wakefield's Fourth Quarter Report (2009). Our goal is to identify the amount of available space and the cost of the space. Real estate is a substantial expense for companies that need to purchase or rent large amounts of manufacturing and laboratory space. We also used the Census Bureau's American Community Survey to identify the median real estate tax rates per \$1,000 in value.<sup>vi</sup>

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<sup>v</sup> Please see Appendix I- Industry Wages, for a detailed breakdown of all of the numbers cited in this paragraph. This information is from the US Census Bureau's 2008 Quarterly Census of Employment and Wages.

<sup>vi</sup> This number is a median for all types of real property, across all neighborhoods. Often, neighborhoods within cities have different property tax rates. We used this data for a general understanding of the tax rates, although it is not exactly the property tax that a company would pay in any of these neighborhoods.

TABLE 4. LAND &amp; FACILITIES METRICS

	Least Attractive	Less Attractive	Median	More Attractive	Most Attractive
	Industrial Space Vacancy Rate (4Q09) <sup>21</sup>	Total Vacant Industrial Space (square feet) <sup>22</sup>	Manufacturing Space \$/sqf/yr (4Q09) <sup>23</sup>	Median Real Estate Tax Rates per 1,000 of Value	
Austin	17.70%	7,741,325	\$4.92		18.17%
Boston	18.00%	30,908,510	\$5.69		8.23%
Denver	8.10%	16,084,004	\$4.33		6.76%
Detroit	19.50%	64,200,007	\$4.04		12.36%
Houston	9.70%	32,877,554	\$4.48		18.17%
Los Angeles	5.60%	34,390,959	\$6.36		4.77%
New York	8.40%	42,059,934	\$6.01		11.88%
Portland	8.70%	15,314,144	\$4.80		9.49%
Sacramento <sup>vii</sup>	n/a	n/a	n/a		4.77%
San Diego	8.90%	16,818,281	\$8.04		4.77%
San Francisco	8.10%	5,122,220	\$10.19		4.77%
San Jose	13.60%	32,835,866	\$8.50		4.77%
Seattle	9.30%	12,020,062	\$6.19		9.88%

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<sup>vii</sup> Cushman & Wakefield did not have data on the land in Sacramento.

## *GAP ANALYSIS*

The industrial vacancy rate in Los Angeles is the lowest among the cities. However, in absolute numbers of square feet, the amount of vacant industrial space in Los Angeles is higher than nine of the competing cities. Los Angeles has the capacity for companies who want to locate there; however, this industrial space consists primarily of small to medium sized parcels.<sup>24</sup> Other cities, like Detroit, have larger parcel sizes for companies that might need more land for their business. Furthermore, a study of industrial land done by the CRA/LA and Los Angeles Planning Department revealed that relaxed zoning codes in Los Angeles have led to the illegal conversion of 25% of industrially zoned land to other uses; this is particularly harmful because only 8% of the land in Los Angeles is industrially zoned.<sup>25</sup> Both CRA/LA and Planning have engaged in long-term planning regarding preserving this industrial land and strengthening the zoning code.

Compared to its competitors, the price per square foot of industrial space in Los Angeles is on the higher end at \$6.36 per square foot. Detroit's land is the cheapest at \$4.04 per square foot while San Francisco's land is the most expensive at \$10.19 per square foot. Los Angeles' land is still considerably cheaper than San Diego, San Francisco, and San Jose.

California's median property tax rate, however, is the lowest compared to the other states. With the high cost of industrial space in the other cities in California, companies interested in locating to urban areas of California would find the cheapest land in Los Angeles. Compared to the cheap land available in competitor cities outside of California, however, the low property tax rate only slightly counteracts the high cost of land.

## **Business Placement Factor #3: Business Environment**

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

The ease of business permitting, cost of regulatory requirements, and relationship between local government and the business community contribute to the general business environment in a municipality. Although often based on perception more than reality, a city or region's business environment plays a crucial role in the location decision-making process.

Regardless of their location, every business needs to file permits, follow regulations, and pay taxes. Operating a business becomes more difficult and costly when these processes are expensive, time-consuming, or difficult to understand.<sup>26</sup> Cities with sprawling bureaucracies and backlogged business permitting and registration are viewed as unresponsive or unfriendly to business. A city's responsiveness, transparency, and information distribution contribute to the perception of a city's business environment also.

METRICS AND DATA SOURCES

We use data from Forbes magazine's "Best Places for Business and Careers 2009" rankings to measure the business environment in these regions. Forbes’ cost of doing business index evaluates 200 of the nation's largest metropolitan areas based on the combined cost of taxes, energy, regulations, labor, and office space. The index ranks regions from 1 (Greensboro, North Carolina) to 200 (New York, New York), with 200 being the most costly place to do business.<sup>27</sup> This ranking identifies the difficulty and expense of conducting business in Los Angeles, compared to other cities.

TABLE 5. BUSINESS ENVIRONMENT METRICS<sup>28</sup>



GAP ANALYSIS

According to these rankings, Los Angeles is among the most costly places to do business with a ranking of 177. Five of our twelve competing regions have higher costs of business. Many of them have successfully attracted various firms in their own unique sectors (e.g. San Jose’s high technology and electronics manufacturing, New York’s financial services industry).

Regardless, this cost of doing business rank for Los Angeles is further aggravated by the city government’s negative reputation amongst the business community.<sup>29</sup> According to a survey released by the Los Angeles County Business Federation, 74 percent of business respondents in Los Angeles

said the city is unfriendly to their businesses, compared to 44% of respondents in neighboring cities in LA County.<sup>30</sup> Currently, developers and businesses need to complete twelve permits in order to begin a project or build a business.<sup>31</sup> Two years ago, Mayor Villaraigosa tasked the Planning Department and the Department of Building and Safety with decreasing the number of necessary permits from twelve to two. The so-called “12-to-2” initiative has since been stalled “due to budget cuts and a long-standing mentality among departments that concerns- or approvals- of other departments don’t matter...also cited [were] tensions between department heads.”<sup>32</sup> Articles in local newspapers, blogs, and in reports about the state of business in Los Angeles consistently cite the negative reputation of the City for businesses leaving or choosing not to locate to Los Angeles.

## Business Placement Factor #4: Financing & Funding

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

The availability of local funding opportunities for businesses lessens startup operational costs and provides a safety net for future business developments. This business placement factor includes small loans, grants, or bonds that finance the technological, job creation, or real estate capacities of a business. It also includes geographically specific incentives related to zoning, including redevelopment zones and federal empowerment zones. Often, financial incentives are the first factors on which governments take action. Financial incentives, however, are only one aspect of a business’s placement decision. In fact, when ranking the importance of business placement factors, direct financial incentives usually fall to the bottom of the list.<sup>33</sup> Furthermore, research indicates that financing and funding play a significant role in shifting intraregional growth while typically not swaying the decision maker between regions.<sup>34</sup>

### *METRICS AND DATA SOURCES*

Because of the subjectivity of the availability of programs to each of these localities, we did not use a standardized metric for this business placement factor. Instead, we based our analysis on the presence of these programs in these regions. Please refer to Appendix 3.5 for a comparison of regions and Appendix 4 for various maps of relevant zones in Los Angeles.

### *GAP ANALYSIS*

Eight of the twelve cities have federal Empowerment Zones; Los Angeles is one of them. All businesses located in these zones receive special incentives from the federal government, which include “employment credits, a 0% tax on capital gains, increased tax deductions on equipment, accelerated real property depreciation, and other incentives”.<sup>35</sup> These zones are situated in areas in need of outside investment to reach their economic development goals. Many states have instituted

similar programs that are usually called Enterprise Zones. Every competitor city, including Los Angeles, has a segment of the city designated as a state enterprise zone (or its equivalent). In Sacramento, the city leadership has taken the initiative of renaming one of their enterprise zones; it is now called the “Cleantech Enterprise Zone” with the goal of attracting cleantech companies into that zone to receive incentives such as a hiring tax credit, sales and use tax credit, net interest deduction for lenders loaning to companies in these zones, and more.<sup>36</sup>

All of the cities have loan funds for companies. However, these loan funds are often funded by the state. Many of these programs are targeted for the purposes of developing technology or are linked to job creation metrics. Most of the cities had sales tax exemptions on manufacturing equipment or investment tax credits for renewable energy manufacturing companies.

## **Business Placement Factor #5: Industry Clustering**

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

Industry clustering refers to the presence of an industry in a geographic location. In other words, cleantech companies look for business, research, policy, and employment activity in the cleantech sector in the regions that they are considering for business location. This could mean that companies want to locate near one of their suppliers, near a company that uses their product in their own supply chain, or near research centers and universities. Having access to these resources can develop their product, staff, revenues, or business plan. For a more detailed overview on applications of cluster theory, see Appendix 1.5.

### *METRICS AND DATA SOURCES*

In order to measure the prevalence of clustering in these regions, we used data regarding the cleantech job activity in regions from Clean Edge’s “Job Trends 2009” report.<sup>37</sup> To determine these rankings, Clean Edge uses a variety of datasets including job postings, investment activity, patent activity, and the presence of cleantech jobs.<sup>38</sup> This ranking serves as a signal for a region’s innovative capacity in regards to the cleantech industry. Less explicit evidence of regional clustering can be found in Appendix 3.9, and maps of potentially relevant firms in the Los Angeles region can be found throughout Appendix 4.

**TABLE 6. INDUSTRY CLUSTERING METRICS<sup>39</sup>**

Rank	Cleantech Job Activity - Top U.S. Metro Areas
1	San Francisco - Oakland - San Jose, CA
2	Los Angeles - Riverside - Orange County, CA
3	New York - Northern New Jersey - Long Island, NY-NJ-CT-PA
4	Boston - Worcester - Lawrence - Lowell - Brockton, MA-NH
6	Denver - Boulder - Greeley, CO
7	Seattle - Tacoma - Bremerton, WA
8	Portland - Salem, OR
10	Sacramento - Yolo County, CA
11	San Diego, CA
12	Austin - San Marcos, TX
14	Detroit - Ann Arbor, MI

### *GAP ANALYSIS*

According to this ranking, Los Angeles has the second highest concentration of cleantech activity in the country. Los Angeles's renewable energy and efficiency policies have created an atmosphere of necessity and innovation around cleantech. Its universities are at the forefront of cleantech research; UCLA, USC, and Caltech combine for roughly \$1.6 billion a year in research funding, and collectively issue over 200 patents a year.<sup>40</sup> The real indicator of success will be the region's ability to sustain and expand this growth by commercializing technologies in locally incubated businesses and driving economic development programs towards the specific sector.

## **Business Placement Factor #6: Transportation Systems**

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

Cleantech companies import and export substantial amounts of raw materials and finished products. When it is easy to transport products and people, the reach and impact of a product is expanded. Modern transportation methods have made the world more interconnected than ever, allowing businesses to benefit from locating in a region with sophisticated transportation options.<sup>41</sup> Goods manufacturers that are popular in foreign markets rely upon easy access to ports while companies that rely upon intellectual capital need convenient and quick air connections to major national and international hubs.



## METRICS AND DATA SOURCES

We used rankings of airport passenger boardings and container traffic as the two metrics for comparing transportation access and availability. To measure accessibility to airports, we used the Federal Aviation Administration 2008 ranking of airports by number of passenger boardings.<sup>42</sup> This metric assesses the availability of flights for a region, therefore signaling the access for business travelers and the accessibility to and from the city. In the DCI survey, 53% of respondents said that they consider access to business travel as the most “important source of information that influences their perceptions of a community’s business climate.”<sup>43</sup>

To measure port access, we used the US Army Corps of Engineers 2008 rankings for ports by container traffic. Container traffic is measured by the number of twenty-foot equivalent units (TEUs) that a port handles each year.<sup>44</sup> Cleantech companies need easy access to ports, and they need to know that the local port has the capability to handle various types and sizes of shipments on a regular basis.

**TABLE 7. TRANSPORTATION SYSTEMS METRICS**

	Least Attractive	Less Attractive	Median	More Attractive	Most Attractive
	Ranking of airport w/ most passenger boardings in US <sup>45</sup>			Ranking of port by TEU traffic <sup>46</sup>	
<b>Austin</b>	<i>(Austin International is not ranked)</i>			(200 miles from #8 Houston)	
<b>Boston</b>	#19 Logan Int'l			#23 Port of Boston	
<b>Denver</b>	#10 Denver International Airport			<i>(none)</i>	
<b>Detroit</b>	#11 Detroit Metro Airport			<i>(Port of Detroit is not ranked)</i>	
<b>Houston</b>	#9 George Bush			#8 Port of Houston	
<b>Los Angeles</b>	#3 LAX, #58 Burbank, #79 Long Beach			#1 Port of Los Angeles, #2 Long Beach	
<b>New York</b>	#7 JFK, #10 Newark, #20 LGA			#3 Port of NY & NJ	
<b>Portland</b>	#33 Portland Int'l			#19 Port of Portland	
<b>Sacramento</b>	#38 Sacramento Int'l			<i>(Port of Sacramento is not ranked)</i>	
<b>San Diego</b>	#29 San Diego Int'l			#32 San Diego	
<b>San Francisco</b>	#7 SFO, #31 Oakland			#6 Port of Oakland	
<b>San Jose</b>	#37 San Jose			(40 miles from #6 Port of Oakland)	
<b>Seattle</b>	#18 Seattle-Tacoma Airport			#10 Port of Seattle, #7 Port of Tacoma	

## *GAP ANALYSIS*

Los Angeles is the most accessible region in regards to access to airports and ports. This is very important to cleantech firms that need access to other markets in the United States or abroad. Preserving the access to these airports and ports is essential to the success of a cleantech attraction strategy.

## **Business Placement Factor #7: Quality of Life**

### *DEFINING THE BUSINESS PLACEMENT FACTOR*

The least tangible factor, the perceived quality of life of a region, is nonetheless a component of the final decision making process for a business relocation or placement. Unlike other business placement factors, this measure is often dependent on an individual's preferences and priorities (e.g. proximity to family members, weather conditions, etc). However, there are some factors about the quality of life in a region that can be used without normative evaluation.

### *METRICS AND DATA SOURCES*

The first metric we used to define quality of life was Kiplinger's Cost of Living Index. This index uses housing, utility, and transportation costs to calculate a figure for the cost of living in that region. The national average is 100. In addition to this general cost of living index, we also compiled data about quality of life factors that were often mentioned by business professionals.

Commute times are often listed as a determinant of quality of life. The U.S. Census Bureau collects information on the travel time to work for workers 16 years of age and older who do not work at home via the American Community Survey (ACS). The most recent table compiled for average commute by city is available for 2003.

Forbes has also developed a ranking of "America's Safest Cities" according to a composite of rates of violent crime, workplace deaths, fatal automobile crashes, and natural disasters for cities across the United States.<sup>47</sup> Finally, we used the Department of Commerce's National Climatic Data Center (NCDC) to find information on each city in regards to the percentage of days in a year that have sunshine.<sup>48</sup> This metric is used as a measurement of weather patterns in Los Angeles and its competing cities.

TABLE 8. QUALITY OF LIFE METRICS

	Least Attractive	Less Attractive	Median	More Attractive	Most Attractive
	Cost of Living Index (U.S. average = 100) <sup>49</sup>	2003 Average Vehicle Commute (minutes) <sup>50</sup>	America's Safest Cities Ranking <sup>51</sup>	% of Annual Possible Sunshine <sup>52</sup>	
Austin	94	21.9	15	60%	
Boston	129	27.3	4	58%	
Denver	101	22.6	10	69%	
Detroit	100	24.7	12	53%	
Houston	89	25.8	38	59%	
Los Angeles	142	29	19	73%	
New York	121	38.3	8	58%	
Portland	117	22.4	3	48%	
Sacramento	115	20.6	24	78%	
San Diego	132	23.4	13	68%	
San Francisco	137	28.5	25	66%	
San Jose	158	23.8	7	n/a	
Seattle	114	25.7	4	47%	

### GAP ANALYSIS

The cost of living in Los Angeles is much higher than the national average, and significantly higher than all of the regions except for San Jose. That noted, regions with desirable qualities of life are likely to be more expensive, as people are willing to pay a premium for a lifestyle that they want.

Los Angeles suffers from the one of the nation's most notorious commutes. Although not the longest average commute among commuter cities, Los Angeles's deficits in public transportation options often leave workers with few alternatives for transportation to and from their places of employment. Further, when compared to its competitor cities, Los Angeles ranks on the lower end of the scale on the "Safest Cities ranking". Finally, the sunshine and weather in Los Angeles is only outdone by Sacramento.

## Los Angeles's Comparative Strengths & Weaknesses

Aside from assessing Los Angeles and its competitor cities on the seven business placement factors, we also surveyed all twelve competitor cities to identify their various economic development programs. Some cities offer cleantech specific incentives, but we found that many cities market general incentives towards cleantech firms. We organized these incentives according to the business placement factor it best addressed. By comparing the programs available at each of these cities, we were able to better assess the strengths and weaknesses in Los Angeles's approach to its business policy, cleantech strategy and general competitive ranking for cleantech business placement.

Detailed lists of all of the programs mentioned below, are included in Appendix 3. Using the previous gap analysis and a comparison of the programs available in each city, we identified seven summary findings about Los Angeles's competitiveness.

### Finding #1: Workforce

#### *Los Angeles lacks targeted training and development.*

There is a large and diverse manufacturing base in Los Angeles with various supply chain capabilities for the cleantech sector. The manufacturing base is important to the local economy, as evidenced by high GDP output and a significant employment base. However, manufacturing employment in Los Angeles has steadily declined over the last several decades, and many of the remaining manufacturing jobs in Los Angeles are low-wage and low-skilled. However, the manufacturing jobs that are currently in Los Angeles are primarily low-wage manufacturing jobs. Some higher-skilled manufacturing workers and former workers may have transferable skills for the cleantech sector, but others will need training in order to transition to specialized cleantech manufacturing jobs.

Local workforce development programs and community colleges are developing green job training programs. However, these programs must be informed by business needs, with consideration towards career ladders with growth potential. Cities like Portland, New York, Detroit, and San Jose have engaged their business leaders in directed training programs. Boston and Denver have instituted local tax exemptions for new jobs created and San Francisco has exempted cleantech firms from payroll taxes.

## Finding #2: Land and Facilities

*Los Angeles has significant amounts of expensive and vacant industrial land.*

Los Angeles's vacancy rate is relatively low; however, when comparing the absolute number of square feet of vacant industrial land, Los Angeles has more vacant industrial land than nine of the twelve competing cities. Although not as expensive as land in San Francisco, San Jose, or San Diego, the cost of the industrial space in Los Angeles is still higher than the median cost in its other competing cities. However, the property tax rates in California are lower than in any other state. Acknowledging their high property tax rates, other cities and states have instituted various property tax abatement programs and loans for improvements to industrial facilities.

## Finding #3: Business Environment

*Los Angeles is perceived as unfriendly to business.*

Businesses perceive Los Angeles as a costly and overly bureaucratic place to conduct business. Compared to its competitor cities, Los Angeles has a substantial lack of business assistance programs, automated online services, and targeted business information. Other cities have developed one-stop shops, expedited permitting, online dynamic mapping applications (with parcels, demographics, and zones), business retention and relocation centers, economic development websites with online permitting capabilities and summary information—all targeted directly at cleantech firms.

## Finding #4: Financing and Funding

*Los Angeles has many programs that need direction and improvement.*

Los Angeles has more federal zones, state zones, and redevelopment project areas in industrial areas than its competing cities. However, other cities have developed detailed economic development programs with loan funds, grants, loan guarantees, tax credits, and bonds that are specific to the needs of these cleantech firms. Los Angeles needs to develop an economic development program and targeted incentives that amplify the importance of cleantech to its economy.

## Finding #5: Industry Clustering

*Los Angeles's foundation for cleantech industry engagement needs to be strengthened.*

Los Angeles has developed CleanTech LA, the Cleantech Corridor, and the CleanTech Manufacturing Center, and is currently in the process of developing a cleantech incubator. The city needs to exercise stronger leadership in these initiatives by facilitating greater interaction with key stakeholders,

investors, researchers, and entrepreneurs. Other cities hire cleantech-dedicated staff and play integral roles in mobilizing regional cleantech networks.

## **Finding #6: Transportation Systems**

*The airport and port infrastructure in Los Angeles is the strongest in the nation.*

The capacity of the airports and ports in Los Angeles surpass those in all competitor cities. As a result, Los Angeles has significant advantages for cleantech businesses which require travel and trade. Given this strength, we do not identify specific policy options for the City of Los Angeles in regards to its transportation systems. We recommend that the City market these assets to its advantage. A detailed look at transportation accessibility in relation to local firms can be found in Appendix 4.6.

## **Finding #7: Quality of Life**

*Improving the quality of life in Los Angeles is a long-term, multi-level strategy for the entire City of Los Angeles.*

Quality of life is difficult to quantify, but some statistics and rankings indicate how Los Angeles is perceived by those not from the city. Various city government decisions can influence the region's ability to recruit top talent. Policies addressing issues as varied as K-12 education, congestion relief, transit expansion, affordable housing and access to open space contribute to the perception and attractiveness of Los Angeles. These require long-term visioning of the Los Angeles's mission and strategic goals. We do not identify policy options specific to this factor, but the City must publicize its attractive assets and continuously work to improve local conditions in order to appeal to firms.

## Summary of Findings

TABLE 9. SUMMARY OF LOS ANGELES'S COMPETITIVENESS

Business Placement Factors	Is L.A. Competitive?	Why?
Workforce	Yes	L.A. has a large, diverse, and low-wage manufacturing labor base, but must work to target training programs
Land and Facilities	No	The vacancy rate in L.A. is the lowest among competing cities and price-per-square foot of industrial space is on the higher end
Business Environment	No	L.A. is among the most costly places to do business, and the city government is perceived as extremely unfriendly to business
Funding and Financing	No	Incentives limited to "zones", L.A. has no cleantech specific funding or financing, and other cities have more aggressive packages
Industry Clustering	Maybe	L.A. has the second highest concentration of cleantech job activity in the country, and strong potential for innovation through local universities, but interaction between firms and government needs to be strengthened
Transportation Systems	Yes	Port of L.A./L.B. largest in the U.S. and LAX is 5 <sup>th</sup> largest airport globally
Quality of Life	Maybe	Cons: High cost of living, limited mass transit, traffic Pros: Weather, cultural amenities, quality higher education

Strategy for Addressing Los Angeles’s Weaknesses

Business location decisions incorporate considerations towards all seven business placement factors. Placement decisions result from a single, strong economic development policy or several incentives, and the importance of one policy in relation to another may be difficult to assess. In order to strategically adopt incentives, municipalities can address their comparative strengths and weaknesses. Given the gap analysis above, we structured this section to identify and evaluate appropriate policy options for mitigating Los Angeles’s key weaknesses. Below, we list the most promising incentives being used in competitor cities to address similar challenges. Our consolidation of the business placement factor gap analysis, competitor city incentive research, and critical Los Angeles weaknesses resulted in the options listed in Table 10 below.

TABLE 10. POLICY OPTIONS FOR LOS ANGELES CLEANTECH

WORKFORCE:	Cleantech Industry Skill Panels
LAND & FACILITIES:	Property Tax Abatement
BUSINESS ENVIRONMENT:	Cleantech Business Assistance Center Local Purchasing Preference Enhanced Economic Development Website and Online Tools
FINANCING & FUNDING:	Revolving Loan Fund
INDUSTRY CLUSTERING:	Enhanced Regional Cleantech Network Demonstration Projects Cleantech Incubators Cleantech Focused Staff and Expedited Permitting Service



## Criteria for Evaluating Policy Options

We evaluated the policy options based on three criteria: financial impact, ease of implementation, and benefit to firms. These criteria are key to determining meaningful and actionable measures that the City can adopt to foster cleantech cluster development. We devised nominal scales for each criterion, and ranked each policy option based on our research, interviews, and our institutional knowledge of the internal political and fiscal climate within the Mayor's Office, City Council, and the City's various departments and agencies.

## Difficulties Evaluating Incentive Impact

Gauging the effectiveness of a policy option in attracting and retaining cleantech firms is both practical and important. After all, adopting incentives or programs that have the greatest impact on cleantech economic activity and job creation is crucial to the success of Los Angeles's cleantech strategy. However, we discovered that primary quantitative data measuring the effectiveness of incentive programs were either not tracked by city governments or were considered proprietary and confidential.

Furthermore, a literature review of commonly offered local economic development incentives revealed numerous conflicting conclusions regarding their effectiveness.<sup>53</sup> Despite quantitative and qualitative analyses, there is little consensus regarding the ability of these programs to spur economic growth, and there are limited consistencies in the magnitude of successes and failures observed. Given data constraints and the wide variation between analyses of economic development programs, we were unable to authentically quantify the specific impact of each incentive on cleantech firm location decision-making and job creation. Furthermore, this measurement is not the central focus of our paper.

It is important to note that the implementation and affordability of a program or policy is crucial to its success. The success or failure of these programs is as dependent on its structure as its implementation. Based on best practices observed in other regions, we provided Los Angeles-specific recommendations for implementation in the following chapter.

## Financial Impact

With Los Angeles's current budget deficit, costs pose a considerable constraint on the City's ability to adopt various policies. Options that require significant capital from the General Fund, the CRA/LA, or City department funds may simply be infeasible at the present, even if long-term financial returns are expected. For the time being, the City's interest is in adopting zero- to low-cost incentives and deflecting or sharing costs with external sources when possible.

The term “financial impact” reflects required staffing, up-front capital and the source of funding. Considering the City’s fiscal situation, we evaluated the anticipated financial impact of each policy option on a scale of “low,” “moderate,” and “high.” We relied on interviews with city staff for cost estimates. We also accounted for costs incurred within a short-term time frame of three fiscal years and considered costs above \$150,000 as more significant than those below.<sup>viii</sup> In general, we value allocations from the General Fund least favorably, followed by contributions from the CRA/LA and city departments, followed by funding from proprietary departments. Costs to external or private sources are viewed as most favorable. We took both features into account and assigned the values as outlined in the following table:

TABLE 11. FINANCIAL IMPACT CRITERIA

		Funding Sources			
		General Fund	CRA/LA or City Departments	Proprietary Departments	Private
Expected Costs	< \$150k	High Impact	Moderate Impact	Low Impact	Low Impact
	> \$150k	High Impact	High Impact	Moderate Impact	Low Impact

Ease of Implementation

Critical to providing reasonable recommendations is an acknowledgement of the ease of implementing a proposed policy option. We measured political feasibility as a function of two factors:

- The authorization needed to adopt an incentive or program; and
- The anticipated political support and opposition the policy is likely to generate.

Many economic development programs offered by cities are funded and administered by city departments, such as the CRA/LA and LADWP. However, the adoption of each policy option requires different levels of authorization. For example, the general manager of the LADWP has the authority and discretion to sign contracts of up to \$150,000 without seeking the approval of the

<sup>viii</sup> The threshold of \$150,000 was chosen to reflect the same cutoff point at which many City department initiatives require Council Approval.

LADWP Board of Commissioners.<sup>54</sup> However, contracts exceeding that amount are subject to board approval, and if the expenditure is high enough, City Council approval might be required as well. Typically, expenditures by the LADWP and the Port of Los Angeles in excess of \$150,000, and expenditures by the CRA/LA in excess of \$50,000, require board approval, which can make policies more difficult to adopt.<sup>55</sup>

However, just because a policy can be authorized by a general manager does not make it politically feasible. General managers are appointed by the Mayor and subject to City Council approval, but they also have obligations as chief executives of their department and are often governed by their own charter or codes. Policies that require council approval can be more difficult, because it can require the support of at least eight out of fifteen members, each of whom have their own political interests and constituencies to represent. Therefore, we ranked policy options that only require the Mayor's approval as "easy," those that require a General Manager or Board of Commissioners approval as "moderate," and those that require City Council approval as "difficult."

Political feasibility is also impacted by the political will behind a policy. For example, a policy might require city council approval, which under the previous criterion ranks as politically difficult. However, if there is enough political pressure or support for a policy, the approval of the policy becomes easy. This is clearly a difficult criterion to quantify in a standardized approach. We relied on numerous and ongoing interviews and discussions with our clients and staff throughout city departments to assess the political feasibility behind each policy. Policies that have broad political support or momentum were ranked as "easy." Policies that have some form of political support were ranked as "moderate," and those that we felt has little or no support were ranked as "difficult."

## Benefit to Firms

The third criterion for policy evaluation is the benefit experienced by firms. Each of the policy options addressed in the following chapter is geared towards improving one of Los Angeles's specific weaknesses. However, these options vary in the type of direct or indirect impact that it would have on cleantech firms.

We categorized the benefit that each incentive would provide to firms as either a "direct financial benefit," a "transaction cost reduction," or an "indirect benefit." "Direct financial benefits" include: tax reductions, credits, rebates, exemptions, and abatements; fee reductions and abatements; grants; awards; discounted utilities; and financing options including loan funds and bonds. "Transaction cost reductions" lower the costs of doing business not covered under "direct financial benefits" by expediting processing times and connecting businesses with necessary services quickly. "Indirect benefits" strengthen the quality of local businesses and foster regional economies of scale for cluster development. These benefits include workforce development and strong networking opportunities.

## Policy Options

### Addressing LA's Weakness: Workforce

#### *CLEANTECH INDUSTRY SKILL PANELS*

The skills and availability of the local workforce are an important business placement factor for cleantech companies that are considering operating in Los Angeles. According to our data collection, Los Angeles's manufacturing sector employs approximately 12.5% of the city's workforce.<sup>56</sup> Retraining and preparing the manufacturing workforce for cleantech job paths and career ladders is essential for preparing the local workforce for the City's cleantech business strategy.

However, in order for this to work, employers need to be involved in workforce development planning. Los Angeles needs cleantech industry-specific workforce development programs that are jointly planned between workers and management. Training programs need to be focused on particular job paths and career ladders in the cleantech industry, and more specifically, in the cleantech companies that are forming or locating here. Other cities have instituted Industry Skill Panels with cleantech business owners, current employees, and potential trainees to develop a workforce development program that trains the workforce for the specific jobs that cleantech companies need. The industry skill panel model creates "locally-driven public-private partnerships of business, labor, and education that address immediate or long-term workforce needs for a specific industry."<sup>57</sup>

The City of Portland instituted Cleantech Industry Skill Panels that "comprise of a cross section of companies in particular industries [that] prioritize occupations necessary for continued growth of the industry and identify the unique training needed to prepare workers for those positions. These panels select the training providers to ensure the classes meet their specific needs. The skill panel model is also ideal for adding skill needs in targeted recruitments and expansions."<sup>58</sup> New York City's Business Solutions Training Funds "provide up to \$400,000 to fund 60-70% of eligible training costs."<sup>59</sup> This could fund training by the manager of the company or by a workforce development center. This approach leverages the resources outside of the capabilities of the City's workforce centers to fund the training needs of local businesses.

#### FINANCIAL IMPACT: LOW

The City of Los Angeles offers numerous workforce development and placement programs for residents. With twenty-one WorkSource Centers, an active Workforce Investment Board (WIB) and Community College District, and millions of dollars of ARRA grants, Los Angeles may already have the resources necessary to better target the needs of cleantech businesses. Engaging businesses to

identify their specific needs is at no cost to the city or its departments, but may require a reallocation of time and resources from other types of workforce training programs. Our interviews with community college training directors at Valley College and Community Development Technologies (CDTech) revealed a consensus that green job training is already a focus of recent expansion. These training directors may still be able to refocus these strategies on cleantech company needs with low financial impact to the city.

#### EASE OF IMPLEMENTATION: EASY TO MODERATE

This program requires no additional statute adoption. Reorienting the work of the current training programs would require buy-in from training programs and administrators. The political feasibility of Industry Skills Panels is high because it engages businesses, training programs, unions, and employees in a comprehensive planning process that is meant to benefit all of them. Los Angeles's Workforce Investment Board (WIB) could spearhead the planning of these panels, as their mission is "to develop, in concert with the Mayor and City Council, policy and strategy to ensure that business has access to a trained workforce and workers have access to quality jobs. All of the WIB's services operate on the premise that upward mobility for workers impacts and elevates the prosperity of cities, counties, states, and the country."<sup>60</sup>

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

This program would directly benefit businesses; their labor needs would be fulfilled by the reorientation of training programs to their specific requirements. When planning expansions or recruitment, businesses would have an immediate resource in their vicinity.

## Addressing LA's Weakness: Land & Facilities

### *PROPERTY TAX ABATEMENT*

Some competitor cities encourage business location by providing property tax reductions or abatements for certain types of firms. Detroit, for example, offers 50% property tax abatement on real and personal property for industrial and high technology facilities for up to 10 years.<sup>61</sup> Texas firms producing on-site renewable energy generation are also eligible for reduced property taxes.<sup>62</sup> In addition, property tax abatement is provided to businesses rehabilitating blighted industrial facilities. For example, New York's Industrial and Commercial Abatement Program "provides abatements for real property taxes for varying periods up to 25 years. Eligible industrial and commercial buildings must be built, modernized, expanded, or otherwise physically improved."<sup>63</sup>

Los Angeles can offer similar property tax abatements for firms within specific industries (i.e. cleantech, high technology, or manufacturing) or in certain regions to encourage rehabilitation of industrial space (i.e. within the designated CleanTech Corridor). This is particularly relevant because, when compared to its competitor cities, the cost of industrial space in Los Angeles falls on the more expensive side of the spectrum.

### *FINANCIAL IMPACT: HIGH*

The cost of this policy would be significant, as this option would decreased the amount of property taxes collected. However, property tax reduction may encourage firm location that would otherwise not occur. In these instances, collection of reduced property taxes results in increased revenue that would alternatively remain unrealized. While net returns from this option are difficult to assess, we rate property tax abatement as having a high financial impact, since the City will directly bear the costs of the policy.<sup>64</sup>

### *EASE OF IMPLEMENTATION: DIFFICULT*

This would be a very difficult policy to pass. First, it would need to be approved by the State of California and property tax issues are particularly contentious in California. The abatement of these taxes would impact the general fund of the city and state during a time where both budgets are projecting near-record deficits. Furthermore, this policy both ignores and offends the needs of traditional manufacturers that are struggling to retain workers and keep their businesses. In general, the adoption process of property tax abatement is difficult and the political feasibility is low.

BENEFIT TO FIRMS: DIRECT FINANCIAL BENEFIT

This would provide a significant benefit to firms who will have one less cost to consider in their budget. The money they would use to pay for property taxes could be reinvested in a business's operating costs (e.g. technology, labor, commercialization).

## Addressing LA's Weakness: Business Environment

### *CLEANTECH BUSINESS ASSISTANCE CENTER*

Business assistance centers are physical spaces that provide small business owners and aspiring entrepreneurs with a variety of business development resources, such as technical consulting services, access to computers, conference rooms, and other space and equipment. The City could develop a center that caters specifically to cleantech firms and locate branches of the center in the industrial hubs of the city. For example, New York City's Industrial Development Agency (NCIDA) provides and files incentive and tax applications for landowners in industrial areas; further, NCIDA recently began expanding this assistance to developers of rental space.<sup>65</sup> Furthermore, New York opened one of its NYC Business Solution Centers in an "industrial business zone" with "dedicated counselors for industrial businesses...[who] help industrial companies access incentives, comply with regulations, and take advantage of business opportunities [with the City]."<sup>66</sup> This center includes an Industrial Ombudsman Program where an "on the ground ombudsman" travels from door to door in industrial areas, developing relationships and understanding the struggles of local businesses.<sup>67</sup>

Placing a Cleantech Business Assistance Center in the Cleantech Corridor will provide easy access to companies placing their businesses in this zone, and ensure these companies that the City is dedicated to the industry.

### FINANCIAL IMPACT: HIGH

Development of a new cleantech-specific small business assistance center would require significant startup costs for staff, equipment, and building space. We expect costs to exceed \$150,000, though costs may decline in the long-term. However, a center of this sort would likely be created and funded by the CRA/LA or a city department like the Community Development Department. Therefore, we ranked this option high in terms of financial impact.

### EASE OF IMPLEMENTATION: EASY TO MODERATE

The creation of a cleantech business assistance center would most likely be funded and administered by either the LADWP or CRA/LA, and would cost more than \$150,000 to create and operate. Therefore, this option received a ranking of moderate because it would require board and City Council approval. However, as stated in his second inaugural address, helping small businesses is one of the Mayor's top priorities, and members of his staff have been actively exploring this option over the past year.<sup>68</sup> Furthermore, the City Council has also expressed their support for small business assistance, and therefore, this option ranked easy in terms of political support.



#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

This option provides a transaction cost reduction to firms, because it provides them with access to consulting services, space, and equipment that they would otherwise have to pay for. Many cities have noted that small businesses do take advantage of such centers. For example, the city of Austin, Texas recently won an award for being the #1 place in the country for small businesses by Portfolio.com, primarily because of its Small Business Solutions Center, which provides counseling and technical assistance to small businesses.<sup>69</sup> Within the first year, the center generated 2,000 visits, 2,500 hours of use, and resulted in \$2.6M in additional revenue for businesses who used the facility.<sup>70</sup> This option improves the local business environment and lower the barriers to growth, therefore reducing transaction cost.

#### LOCAL PURCHASING PREFERENCE

The City of Los Angeles procures millions of dollars worth of goods and services every year. According to the Los Angeles City Charter, the City is required to accept the lowest cost bid when procuring goods and services. The city can act as a major driving force in its local economy by leveraging its purchasing power; it can adopt a local purchasing preference that gives local firms a slight preference on city contracts. Competitor cities have instituted a 5% or 10% boost on the ranking of a local business's bid on city contracts. For cleantech companies, locating in Los Angeles would mean that they would immediately receive a price preference on the billions of dollars of procurement expected to come from DWP as they procure renewable energy sources.

#### FINANCIAL IMPACT: MODERATE TO HIGH

Local purchasing preferences pose costs when contracts are awarded to local firms that are otherwise not the lowest bidders. In these circumstances, the City pays more than they otherwise would for services, with the expectation that local investments will result in positive, long-term local benefits. Implementation of a local purchasing preference would likely result in costs well above \$150,000 collectively, though actual costs are largely dependent on the details of the program design and the size of the percentage preference. City departments would bear the costs of this program to varying degrees depending on their purchasing behaviors. We therefore ranked this program as moderate to high in terms of financial impact.

#### EASE OF IMPLEMENTATION: MODERATE

A similar policy has been approved by the General Manager of LADWP and his Board of Commissioners.<sup>71</sup> However, it has since been passed to City Council where the policy has remained for months.<sup>72</sup> Therefore, we ranked the option as difficult in terms of the adoption process criterion. However, this policy is considered politically feasible, because both the Mayor's Office, the General

Manager of the LADWP, local businesses, city council and labor are in support of the policy. The high feasibility yet cumbersome adoption process render this policy as moderate to implement.

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

This option would directly impact local firms by ensuring preferred access to their local market. Local businesses would be more likely to secure city government contracts but would not be guaranteed contracts. This somewhat counteracts the higher cost of doing business in Los Angeles and improves the business-unfriendly perception of Los Angeles.

#### *ENHANCED ECONOMIC DEVELOPMENT WEBSITE & ONLINE TOOLS*

Currently, the City's website offers limited information on business assistance, incentives, and regional assets. A single page on the Mayor's Office website currently outlines the City's cleantech goals and four local assets, but fails to truly provide the level of information necessary for cleantech business owners and location specialists to estimate a return-on-investment calculation.<sup>73</sup> More troubling is the preponderance of misdirected and broken links on the Economic Development website, including the link for business incentive programs. The City of Los Angeles can enhance its website, along with the website of its departments and agencies, to be more interactive with the end-user; furthermore, it can target the information to businesses – specifically cleantech businesses – in a streamlined fashion.

We observed a broad range of offerings on competitor city websites that Los Angeles lacked. Examples include:

- Interactive Geographical Information System (GIS) online mapping tools representing zones, incentive areas, demographic data, searchable parcels, and/or existing cleantech firms;
- Site selection tools or information on available property parcels, like San Jose's parcel finder;
- Step-by-step guides for new or relocating businesses;
- Clear compilations of business incentives, sometimes including separate PDF publications or web pages compiling all incentives applicable to specific targeted industries;

These robust websites are critical to economic development marketing for a variety of reasons. In their July 2008 survey, DCI found that corporate executives responsible for site selection ranked the information on economic development websites; they cited information on available incentives as most important (82%) followed by demographic information (73%) and a property directory (49%).<sup>74</sup> Further, when preparing quantitative and qualitative assessments for site selection, companies may analyze insufficient or incomplete data when information on a region is not readily available; this can skew their return on investment (ROI) analysis.<sup>75</sup> Providing clear information about Los Angeles's

advantages and demographics will help to ensure that companies base their site selection analyses on accurate data rather than misinformation or personal assumptions.

Finally, many of Los Angeles' incentives are available in State Enterprise and Federal Empowerment zones. The Public Policy Institute of California recently indicated that while State Enterprise Zones appeared to be insignificant in general, small benefits could be observed when cities marketed programs well and provided GIS map renderings of the zones.<sup>76</sup> Like many other cities have done, Los Angeles can use website materials geared towards cleantech to better advertise these existing zone incentives.

Los Angeles could also address multiple concerns regarding business environment in a single website. Los Angeles would be best served by compiling a comprehensive list or search tool of its available business incentives, zones, and parcels. Integration with web-based, interactive GIS mapping should be considered in conjunction with website development. Finally, a website could include a separate section geared specifically towards cleantech firm owners with extensive demographic information and city comparisons, highlighting Los Angeles's relative strengths.

#### FINANCIAL IMPACT: LOW

The costs of this project would be primarily incurred in the short-term during website development, with costs subsiding for maintenance of the website in the long-term. The development and subsequent launch of the website could likely take place in under two years within a broad pricing range, depending on the additions or exclusions of complex web applications such as GIS-based interactive mapping software. The costs would likely amount to less than \$150,000. Furthermore, the website benefits multiple departments and agencies. These shared benefits indicate opportunity for cost sharing between multiple departments, with potential for external contributions. Generally, this option would have a low financial impact.

#### EASE OF IMPLEMENTATION: EASY

Simple website expansion with increased information and coordination could be managed by a designated web design staff member. A more substantial website overhaul and redesign could easily be contracted to an external web design firm. The project could thus be initiated at the discretion of the Mayor without City Council approval. Furthermore, the lack of coordinated information and professionalism of the City's current economic development website, "Business Solutions", has been recognized by the Mayor's staff and city departments as antiquated and in need of an overhaul.<sup>77</sup> Therefore, there is a great deal of support for this policy option.

#### BENEFIT TO FIRMS: INDIRECT BENEFIT

The primary purpose of an enhanced economic development website is to provide clear and accessible information. Though specific financial incentives and streamlined services are not necessarily enhanced through this option, firms are provided with the necessary data to make informed business location decisions and connect with resources relevant to cluster development, networking, and financing.

## Addressing LA's Weakness: Financing and Funding

### *REVOLVING LOAN FUND*

Revolving loan funds are typically low-interest and gap-financing loans offered by municipalities to new ventures and small businesses so they could rehabilitate or purchase buildings or equipment. Many of the loan funds witnessed in other cities offer 25-year repayment periods to cleantech companies (Appendix 3.5). Several of the competitor cities offered general revolving loan funds including Denver, Detroit, New York, and San Diego.

In an interview with our client, we learned that the DWP has maintained an annual \$5 million Utility Infrastructure Revolving Loan program since 2001.<sup>78</sup> Qualified businesses can use the funds to pay for equipment or building upgrades that improve their energy efficiency. In comparison to other cities' programs, LADWP's program is relatively limited in its scope as it pays for utility-related costs instead of any operating costs or needs. Also, the program "has been undersubscribed since its creation in 2001... it funded a total \$6.7 million in loans in its seven-year history and only roughly \$1.2 million in loans in the past three years."<sup>79</sup>

### FINANCIAL IMPACT: MODERATE

Though loan interest rates may produce financial returns in the long run, establishing a new revolving loan fund typically requires several million dollars in initial lending capital. Loan funds often receive their initial funds from a variety of public and private sources, including federal departments, state appropriations, and private foundations.<sup>80</sup> Pennsylvania established its new Green Energy Revolving Loan Fund with \$48 million, including a \$12 million federal award, and partnered with an investment firm to administer the fund.<sup>81</sup> If Los Angeles is able to pool external funds in a similar manner, establishment and administration of the fund would result in low financial impact. Erring on the side of caution, we ranked this option as moderate under the assumption that City proprietary departments will need to contribute some startup capital for the fund.

### EASE OF IMPLEMENTATION: MODERATE

Because this program would cost more than \$150,000, it would need to be approved by the general manager of the LADWP and its board of commissioners. Therefore, the option is moderately cumbersome to adopt. However, this policy ranked high in terms of political feasibility, because both the Mayor's Office and the General Manager of the LADWP are aggressively pursuing this option.<sup>82</sup>

### BENEFIT TO FIRMS: DIRECT FINANCIAL BENEFIT

This program would directly benefit firms because they would be able to borrow money at below market rates.

## Addressing LA's Weakness: Industry Clustering

### *ENHANCED PARTNERSHIP WITH REGIONAL CLEANTECH NETWORK*

Regional partnerships between public and private institutions are established around the idea of developing the local clean technology sector. A strong regional network of cleantech stakeholders is key for creating the marketplace of ideas necessary for the development of a successful cluster. For example, in the 1990s, despite world-class universities, researchers, and hospitals, as well as abundant venture capital, Los Angeles was unable to leverage these advantages to attract the biotechnology cluster.

Cleantech specific groups in San Diego, New York, Seattle, and Oregon have worked to establish and strengthen their respective regions' clean technology advantages. These organizations vary in size and scope but have had success in marketing their regions to businesses and advocating for cleantech supportive policies and projects. In particular, the CleanTECH San Diego network is recognized as having elevated the level of intraregional cleantech collaboration.<sup>83</sup>

CleanTech LA is an established partnership among leaders in academia, business, and government in Los Angeles. Expanding the membership of the board directly into the venture capital community would strengthen the reach of the organization and bridge a gap in CleanTech LA's leadership. The marketing possibilities are extensive and two-fold: CleanTech LA could change the perception of Los Angeles to that of a capital of clean technology and serve as the go-to spot for cleantech businesses looking to connect to one another in the region.

### *FINANCIAL IMPACT: LOW*

Funding for a strengthened CleanTech LA would come from the private sector, with the goal of incorporating the organization as an independent 501(c)(3) nonprofit. Limited mayoral and departmental staff time would be necessary for the successful development of the nonprofit, posing few direct costs and no predicted impact on City funds.

### *EASE OF IMPLEMENTATION: EASY*

The strengthening of CleanTech LA would only require the Mayor's approval since the organization is currently housed within the the Mayor's Office of Economic and Business Policy.<sup>84</sup> Furthermore, there is widespread support among CleanTech LA's member organizations for its transition into an independent and effective non-profit.<sup>85</sup>

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

Businesses benefit from a stronger CleanTech LA as the organization would lower barriers to entry in the market and provide a virtual and physical space for intra-sectoral collaboration. In conjunction with the city economic development office, CleanTech LA would become a resource for businesses regarding incentives, markets, and connections.

#### *DEMONSTRATION PROJECTS*

Demonstration projects are often used by companies to demonstrate their untested products on government projects; it allows for a trial run of the technology before the government decides to procure a product. Based on an interview with our client, several cleantech firms have requested a demonstration project with the City of Los Angeles.<sup>86</sup> Cleantech firms request to do demonstration projects because the cleantech industry is a relatively new industry with infant and often time-intensive products. Many consumers, including the LADWP and City of Los Angeles, are hesitant to purchase new technologies unless they have been tested or have reached a critical mass. Demonstration projects, therefore, serve the purpose of mitigating technological risk to the consumer and leading to a more rapid adoption of advanced technologies.

#### FINANCIAL IMPACT: LOW

In many cases, demonstration projects are financed by participating firms themselves. Products are donated to the city, whose primary role is to test the performance and quality of the product, and then provide feedback to the firm. For example, the City of Los Angeles owns three fully electric Mini Coopers, which were donated by BMW. Under this financing model, there is no financial cost to the city. However, smaller firms may require city financing for demonstration projects. Some cities have created funds specifically for demonstration projects, like the Technology Advancement Program at the Ports of Long Beach and Los Angeles. This fund is used to support the development and demonstration of new technologies in the port environment

Some regions have undertaken demonstration projects that require additional funding pools. Oregon, for example, launched a Solar Highway demonstration project financed through a third-party and operated by the local utility company.<sup>87</sup> Though ambitious projects like these may require multiple sources of capital, demonstration project financing options are varied and flexible.

#### EASE OF IMPLEMENTATION: EASY

Depending on how much funding, if any, the city chooses to allocate to a demonstration projects program, this option could or could not be subject to departmental or City Council approval. However, because of Los Angeles's current financial situation, we believe the city would most likely pursue a demonstration projects program that places minimal cost to the city in the short-term.



Therefore, in most cases, the Mayor could authorize demonstration projects via a memorandum of understanding.

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

As previously indicated, many cleantech firms that the Mayor's office has met with have requested demonstration projects. Firms benefit from having the city publicize their product, and by receiving feedback on their product's performance. Therefore, we ranked this option as a transaction cost reduction.

### *CLEANTECH INCUBATORS*

By offering office space at a discounted rate, providing access to laboratories and researchers, and linking the resident companies to investors and consultants, incubators provide a space for the development of business and technology. Furthermore, incubators serve to tie businesses to the region by connecting the entrepreneurs to each other, thereby strengthening the ability of Los Angeles to retain any businesses that emerge from the incubator.

The collaborative and supportive nature of an incubator results in nearly 90% of program graduates remaining in business.<sup>88</sup> Incubators are proven to result in up to twenty times more jobs than other government supported business development programs.<sup>89</sup>

Los Angeles can look to many models of success when developing regional incubators. The joint LADWP and CRA/LA Research Lab and Cleantech Incubator should look to MaRS in Toronto, the CleanTech Center in Syracuse, and the Environmental Business Cluster in San Jose to understand how they have generated cleantech activity in their regions.<sup>90</sup>

#### FINANCIAL IMPACT: MODERATE TO HIGH

The construction and operation of a high-quality cleantech incubator in Los Angeles requires significant upfront capital as well as an ongoing funding stream. Expected funding varies with the design of the incubator, though the development of office space, technological resources, and incubator staff are likely to push the project beyond a \$150,000 threshold. Collaboration between the LADWP, CRA/LA, and a private operator can fund the project.<sup>91</sup> Regardless of its expected high rate of return on investment, we expect the financial impact on departments to be moderate to high.

#### EASE OF IMPLEMENTATION: EASY

Any incubator relying upon CRA/LA or LADWP expenditures of over \$150,000 would need to go before the department's board of commissioners and City Council, making the process of its adoption



moderately cumbersome. That said, anticipated political support is high and the project has thus far moved forward without significant roadblocks.<sup>92</sup>

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

Although direct financing would not come from the incubators themselves, they often serve as a center of venture capital activity and facilitate a marketplace of intellectual exchange. Businesses that are admitted into the incubator would benefit in the short term and be more likely to thrive and create jobs in the long term.

#### *CLEANTECH FOCUSED STAFF & EXPEDITED PERMITTING SERVICE*

Throughout the country, cities that are aggressively pursuing the cleantech sector have consolidated their business permitting processes into online only systems and one-stop shops (Appendix 3.6). The cumbersome business permitting process in Los Angeles is an outlier. The proposed “12-to-2” process will be a great improvement, but the delay in its implementation places Los Angeles behind the pack.

Furthermore, several cities, including our intrastate competitors, have established highly visible cleantech focused staff (Appendix 3.6). For example, San Jose’s Clean Tech Strategist is credited with developing the city’s successful fifteen year Green Vision and managing the attraction of more than fifty cleantech firms.<sup>93</sup> A cleantech focused staff person provides both a clear connection from the business community to the government, and a point-person within the city to serve as a resource and advocate for cleantech related issues. Until recently, the City of Los Angeles had a Cleantech Liaison housed in the Mayor’s Office of Economic and Business Policy. The elimination of this position is inconsistent with the expansion of this role in competitor cities.

#### FINANCIAL IMPACT: LOW

The cost of allocating staff to a cleantech specific role depends widely upon the size of the team and seniority of the staff member(s) assigned to this sector. Competitor cities have not created full departments, so it is unlikely that Los Angeles would need to do so. Hiring one to two additional staff members may be managed below or just above \$150,000. Given the current hiring freeze, it is more likely that current staff could be transitioned to this role at no additional cost, resulting in low financial impact.

#### EASE OF IMPLEMENTATION: MODERATE

Austin Beutner, the Mayor’s First Deputy and Chief Executive for Economic and Business Policy, would need to assign staff to a cleantech specific position. However, he recently eliminated a cleantech specific position making it seem unlikely that this position would be recreated.<sup>94</sup> The

expedited processing of cleantech (and other) business permits is a more difficult adoption and delivery process, but the city's political leadership is firmly behind the nascent "12-to-2" plan. Therefore, this option ranked as moderate in implementation.

#### BENEFIT TO FIRMS: TRANSACTION COST REDUCTION

These programs would ease the burden on Los Angeles businesses. A cleantech focused liaison could assist businesses by connecting them to financial opportunities. The effective implementation of the "12-to-2" expedited permitting process would directly lower transaction costs for businesses and provide increased transparency and speed in the review of their submissions.

## A Menu of Varied Options

The following table summarizes the policy options as ranked above, sorted by financial impact:

**TABLE 12. RANKED POLICY OPTIONS FOR CLEANTECH ECONOMIC DEVELOPMENT**

Policy Options	Financial Impact	Ease of Implementation	Benefit to Firms
Demonstration Projects	Low	Easy	Transaction Cost Reduction
Enhanced Cleantech LA	Low	Easy	Transaction Cost Reduction
Enhanced Economic Development Website	Low	Easy	Indirect Benefit
Industry Skill Panel	Low	Easy to moderate	Transaction Cost Reduction
Cleantech Staff & Expedited Permitting	Low	Moderate	Transaction Cost Reduction
Revolving loan fund	Moderate	Moderate	Direct Financial Benefit
Incubator	Moderate to High	Easy	Transaction Cost Reduction
Local Purchasing Preference	Moderate to High	Moderate	Transaction Cost Reduction
Cleantech Business Assistance Center	High	Easy to moderate	Transaction Cost Reduction
Property Tax Abatement	High	Difficult	Direct Financial Benefit

There is no silver bullet for cleantech cluster development. Rather, there is a varied menu of policies and programs that would make Los Angeles a more attractive site for cleantech firms. Mayor Villaraigosa's verbal commitments to the industry need to be strengthened by the financial and staff commitments that would come with the implementation of these policies.

Our analysis reveals that these ten policy options vary in their cost, feasibility, and benefit to firms. They can also vary in their effect on cleantech business attraction and job creation because the design, implementation, and funding of these programs is essential to their success. These programs need to be designed specifically for cleantech companies and marketed accordingly. Firms that are already located here should be included in the development of these programs as well; strengthening any existing cluster will create benefits for additional firms to locate within the city. The greatest successes witnessed in other cities occurred when conventional economic development tools were

developed and targeted specifically for the cleantech sector—both in their policy design and their outreach.

We have specifically avoided a forced ranking of these options because of the lack of commonly-accepted measures for business attraction. For Los Angeles to become a hub of cleantech, it needs to adopt a suite of these policies. Given the current budget deficits that the City is experiencing, we recommend short-term and long-term policy adoption strategies. In the short term, Los Angeles should immediately implement cleantech industry skill panels, an enhanced economic development website, strengthened regional cleantech partnerships, and a demonstration project policy; these could all be implemented quickly and at low cost. Given the great successes witnessed by incubators, the long lead-time needed to develop the space, and the current momentum of the CRA/LA's partnership with DWP, the plans for the cleantech incubator should be prioritized, supported, and funded. The incubator will benefit from the presence of various funding sources because it will provide access to key stakeholders and investors.

The cleantech business assistance center, local purchasing preference, property tax abatement, revolving loan fund, and cleantech staff members and expedited permitting would greatly impact the development of a genuine cleantech cluster in the long term. However, these programs are crucial to the success of a cleantech strategy. The City can begin positioning its resources for these programs by housing the business assistance center at the incubator, by lobbying City Council to pass DWP's current proposal for the local purchasing preference, and by prioritizing the "12-to-2" business permitting program.

## Conclusion: The Prospects for a Los Angeles Cleantech Cluster

In this report, we identified seven key factors for business location that cleantech companies evaluate when selecting a site location. We evaluated the City of Los Angeles's strengths and weaknesses on these factors in comparison to twelve key competitor cities with similar cleantech attraction goals. This evaluation includes standardized measures, rankings, and a comprehensive review of the economic development programs currently employed by Los Angeles's competitors.

Our comparison uncovered strong potential for cleantech growth in the City, as Los Angeles offers strengths in manufacturing, industrial space, and a large, skilled workforce base. However, the City faces enormous challenges in overcoming a reputation of business unfriendliness. Furthermore, many of Los Angeles's economic development programs lack the sophisticated marketing towards industry-specific needs that other cities incorporate throughout their business assistance strategies.

In order to increase Los Angeles's general attractiveness to cleantech business owners, we drew examples of common economic development programs being used in other cities that Los Angeles currently does not offer. We cited ten of these policy options and evaluated them according to their estimated financial impacts, ease of implementation, and benefit of firms. We offer these options for the City of Los Angeles to adopt according to their needs at a given time. From our analysis, the following programs should be implemented immediately: cleantech industry skill panels, cleantech incubator, enhanced website, partnerships with regional cleantech networks, and demonstration projects.

Long-term success of the cleantech economic development strategy relies on the City's ability to foster a true system of interactive firms with strong local entrepreneurship, supply chain linkages, and industry networks. Lessons from cluster theory teach us that it is exceedingly difficult to predict the site of the next industry agglomeration. However, Los Angeles should continuously work to promote development of its burgeoning clusters by aggressively targeting cleantech, working closely with firm leaders, and encouraging industry collaboration. There may not be a silver bullet, but there is a silver lining.

## Appendix 1: Background on Los Angeles and Cleantech

### 1.1 Historical Perspective and Economic Snapshot of Los Angeles

The Los Angeles economy has the largest manufacturing base in the United States. In 2008, the metropolitan Los Angeles' manufacturing sector generated more revenue and employed more people than any other region in the nation.<sup>95</sup> Angelenos produce airplanes, medical devices, apparel, toys, defense equipment, and high technology in factories spread throughout the area. It is the third largest sector in the City of Los Angeles and an integral component of the region's economy.<sup>96</sup>

Despite its large size, Los Angeles' manufacturing sector has been in steady decline. Manufacturing employment in metropolitan Los Angeles fell by 350,000 jobs between 1990 and 2010; a 43% decline.<sup>97</sup> Although the overall decrease in manufacturing employment followed a national trend, Los Angeles suffered disproportionately due to decreases in defense spending during the 1990s, which caused the Los Angeles-based aerospace manufacturing industry to contract. Much of the higher value research, development, and design components of the manufacturing supply chain remain in Los Angeles, but production and assembly has been moved out to lower cost states and countries.

Manufacturing jobs are particularly important to the City of Los Angeles not only because they make up 13.4% of the city's total private sector jobs<sup>98</sup>, but because they provide middle-class employment opportunities. The decline in manufacturing employment disproportionately affected communities most in need of employment. As of February 2010, residents of the city of Los Angeles are experiencing 13.2% unemployment.<sup>99</sup> In areas like South Los Angeles, where manufacturing provides much of the economic base, residents are experiencing unemployment rates as high as 25%.<sup>100</sup> These rates have expedited Los Angeles's need for a new economic development strategy.

Although the City of Los Angeles is required by City Charter to pass a balanced budget every fiscal year, the City of Los Angeles is facing a \$91.8 million budget shortfall this fiscal year (2009-10) and a \$408 million budget deficit next fiscal year (2010-11).<sup>101</sup> The fiscal emergency has led Mayor Villaraigosa to request the layoffs of 4,000 workers from all parts of the city.<sup>102</sup> Declines in city tax revenues are closely tied to the troubled housing, retail, and banking industries and are not forecasted to return to pre-Great Recession levels in the short-term.<sup>103</sup>

### 1.2 The Prospect of Cleantech

As a result of the continuing loss of manufacturing jobs throughout the first decade of the 21st century, economic development leaders in the City looked to cleantech to help fuel regional economic growth and bring back middle class jobs.

Due to national and state policy, the rising cost and volatile nature of energy, and the looming spectre of climate change, investments in cleantech have grown exponentially in the last decade. Massive public sector investments in cleantech, including \$100 billion of American Recovery and Reinvestment Act, enhance the expansion of the cleantech market.<sup>104</sup>

The private sector has been as bullish as the public sector on cleantech. In 2008, the cleantech sector in North America surpassed all other sectors in venture capital investment with \$5.9 billion in total investment.<sup>105</sup> Fifty-six percent of that investment (or \$3.3 billion) went to California companies alone.<sup>106</sup> Only trailing the Bay Area, the Los Angeles region accounted for the second highest amount of cleantech investment, establishments, and job creation in the nation in 2008.<sup>107</sup> Although overall venture capital activity declined in FY 2009, cleantech grew to its largest share of domestic venture capital funding.<sup>108</sup>

### 1.3 Making Los Angeles an Environmental Leader

In May 2007, Mayor Villaraigosa released the city's first ever climate action plan – *GREEN LA*.<sup>109</sup> The plan aims to significantly reduce the city's greenhouse gas (GHG) emissions over the next twenty years by increasing renewable energy use and conservation.<sup>110</sup> The city's utility, LADWP, will increase its proportion of renewable electricity from 14 to 40 percent.<sup>111</sup> This translates into billions of dollars in LADWP contracts and thousands of cleantech related jobs over the next ten years.<sup>112</sup> Related to this goal, Mayor Villaraigosa developed *Solar LA* in November 2008 to create a 1.3 gigawatt solar network of residential, commercial and municipally-owned solar energy systems.<sup>113</sup>

Mayor Villaraigosa also spearheaded the development of CleanTech LA to strategically align the economic development efforts of the city with those of the region's key university and business assets. The Mayor's commitment to cleantech were reiterated in the Mayor's 2009 state of the city and second inaugural addresses, where he indicated that building a cleantech sector in Los Angeles would be one of the top priorities for his second term.<sup>114</sup>

Accordingly, the CRA/LA designated a three-mile stretch of industrial land as the Cleantech Corridor; the Corridor can accommodate all levels of the cleantech value chain from research and development to assembly and manufacturing.<sup>115</sup> Businesses located within the Cleantech Corridor will have access to public transportation and a wide variety of city, state and federal financial incentives, including LADWP energy programs and rebates, State Enterprise Zone and the Los Angeles Federal Empowerment Zone.<sup>116</sup> As envisioned, the Corridor contains the Clean Tech Manufacturing Center (CTMC), an anchor site for cleantech manufacturing;<sup>117</sup> the Clean Tech Research Center funded by LADWP and staffed by university partners;<sup>118</sup> and the Cornfields Arroyo Seco Specific Plan.<sup>119</sup>

## 1.4 How City Government Affects the Local Economy

Numerous cities have approached the attraction of cleantech companies with varying levels of effort. In a time of lean municipal budgets, the allocation of resources towards a targeted economic development strategy needs to be carefully crafted to account for the scope and ability of government engagement along with the needs of businesses. In a January 2010 report entitled “Envision San Jose”, San Jose’s Office of Economic Development identified the role that a city government plays in the development of the local economy. City government:

1. “Shapes the qualities of the community that make [the city] attractive to talented people and world-class companies;
2. Provides assistance and support to business to enable job creation, new business formation, private investment, and industry evolution;
3. Determines how land is used and facilities are developed to ensure balanced, quality community development;
4. Supports development of a local workforce that is skilled, productive, and able to learn lifelong;
5. Communicates the community’s assets, advantages, and aspirations to send a clear, consistent, compelling message to decision-makers and influencers;
6. Establishes policies to align business and community goals to advance community values and aspirations without undermining competitiveness;
7. Spends money on capital projects and service delivery, stimulating economic activity, employment of people, and maintenance of investments; and
8. Provides leadership for long-term economic success, working with public and private partners in the community and region to advance shared goals.”<sup>120</sup>

This list serves as a framework for understanding the levers available to the City of Los Angeles as it seeks to establish itself as a cluster of cleantech activity. As noted in Role #4, city government can assist in developing a local workforce that is skilled and productive through direct workforce incentives. Efforts to shape a community so that it attracts talented people (Role #1) can be led by city policy. The city planning department has direct control over land use (Rule #3), but the amendment of zoning codes is not without political consequences. A city can streamline or clarify basic requirements and regulations for businesses (Role #2) and can play a role in marketing the city as a cleantech center (Role #5), both of which can create a conducive atmosphere for business creation. Financing and funding from the city or city sponsored programs (Role #2) can help foster desirable business activity or relocate it to neglected areas. That said, city governments can position their procurement and capital project activities towards economic development goals (Role #7), the



improvement of infrastructural advantages for accessibility, and the foundation of regional clusters. All of these roles contribute to the ease with which a business can operate in a city and have implications for the likelihood of business placement in city boundaries.

## 1.5 Applying Cluster Theory

Attracting cleantech firms may provide short-term benefits to Los Angeles's unemployment rate, but strategic cluster development is critical for long-term growth. While this report focuses on incentives for improving Los Angeles's regional attractiveness as a site for cleantech business, city government must work to ensure continuous development of a local cluster. The past century has seen an increasing amount of academic research concerning the geographic agglomerations of industries, also known as "cluster theory." These texts provide several relevant considerations for the implementation of Los Angeles's cleantech strategy.

Clusters are roughly defined as geographically concentrated "firms and related economic actors and institutions... that draw productive advantage from their mutual proximity and connections."<sup>121</sup> Successful clusters require strong linkages between businesses that generate "economies of agglomeration." Joseph Cortright of the Brookings Institute compiled the following list of factors unique to clusters. These factors contribute to regions of advanced innovation and particular locational benefits:

1. *"Labor Market Pooling"*: Clusters are able to share the benefits of a concentrated market of workers with specialized skills.
2. *"Supplier Specialization"*: Clusters generate greater demand from suppliers, allowing suppliers to specialize their outputs.
3. *"Knowledge Spillovers"*: Firms benefit from increased transfer of ideas due to frequent inter-firm contact.
4. *"Entrepreneurship"*: Due to knowledge spillovers, clusters encourage the formation of new ideas and new businesses.
5. *"Path Dependence and Lock-In"*: Chance events, often in the form of a technological innovation, lead to a specific trajectory of industry development that other firms follow.
6. *"Culture"*: Successful clusters often benefit from cultural environments open to risk-taking and entrepreneurship.
7. *"Local Demand"*: Firms in clusters may benefit from the local demand for their services.<sup>122</sup>

Unfortunately, numerous examples of failures indicate that it is incredibly difficult to generate a new industrial cluster from scratch policy efforts.<sup>123</sup> Our interviews with Professor A. J. Scott revealed that cluster development is nearly impossible to predict, as it often spurs from chance technological breakthroughs. Despite these constraints, policymakers can work to create an environment conducive

to the development of an emerging cluster. Rosenfeld offers several suggestions of proactive efforts that governments can take to foster the development of an emerging cluster. The most relevant include:

- “Learn how businesses interact and clusters work”
- “Improve the technical support services”
- “Invest in social capital and social infrastructure”
- “Encourage cross-fertilization of ideas across sectors”
- “Recruit companies that fill gaps in cluster development”
- “Develop and organizing supply chain associations; and”
- “Support employees / entrepreneurs”<sup>124</sup>

The recommendations above are useful examples of goals the City should incorporate into its cleantech strategy. By nurturing existing firms, working closely with industry leaders, and supporting entrepreneurship, Los Angeles can foster an environment better suited for long-term cleantech growth. These strategies should inform policy decisions, options, and implementation.

To further cater our analysis towards cleantech cluster development, we focus on Los Angeles’s specific regional strengths as identified by our clients: solar and electric vehicle manufacturing. In order to foster innovation, entrepreneurship, and clustering of these types of firms, Los Angeles must consider the factors unique to these industries. When possible, our research in this report addresses the local comparative strengths of these sectors by examining key components of the solar and electric vehicle supply chains and workforce.

To address the supply chains of solar and electric vehicles, we gathered data on firms with relevant NAICS codes.<sup>125</sup> Storage battery (NAICS 3359) and semiconductor (NAICS 334413) manufacturing industries in particular have potential to spur innovative developments critical to new solar and electric vehicle technologies.<sup>126</sup> We also observe Standard Occupational Classification (SOC) codes for classifications of employees important to cleantech.<sup>127</sup> These specific factors are useful in informing decisions on how to effectively foster growth of the solar and electric vehicle sectors.

## Appendix 2: Current Incentives Available in Los Angeles

The following business incentives are currently available in the City of Los Angeles:<sup>128</sup>

### 2.1 California State Incentives\*

**Business Expense Deduction:** Businesses may elect to expense 40% of eligible cost of a qualified property in the year it is placed in service instead of capitalizing the expense.

**Employer Hiring Credits:** Up to \$35,100 over a 5-year period per each qualified employee can be claimed by a business as a tax credit.

**Net Interest Deduction:** Qualified taxpayers are allowed to deduct net interest for qualified debts made to qualified debtors.

**Net Operating Loss (NOL):** Eligible businesses may elect to carry forward 100% of its NOL for a 15 year period.

**Sales or Use Tax Credit:** Tax credit equal to the sales and use tax paid or incurred in connection with the purchase of qualified property.

**Site Plan Review Fee Waiver:** Fee waiver for review of commercial or industrial architectural plans for projects of 40,000 square feet or greater located in an Enterprise Zone during an initial application for a site plan review.

### 2.2 Local Los Angeles Incentives

**Discounted Electricity Rate:** Reduction of base electricity rate over course of 60 months. \*\*

**Lower Parking Ratio:** Provides reduced parking requirements for Enterprise Zone businesses compared with other areas of the City.\*

**Sewer Facility Charge Exemption:** One-time lump sum payment exemption if the Sewer Facility Charge is over \$17,000. The fee can be paid in installments over five years but interest is payable on any unpaid balance.\*

**Building Façade Lighting Program:** Promotes energy efficient lighting technologies, increases energy efficiency awareness, and improves the utilization of energy capacity during off-peak hours throughout the City of Los Angeles. \*\*\*

**Community Redevelopment Grants and Loans:** Provides financial assistance to businesses by offering grant and loan programs in many of the Community Redevelopment project areas. \*\*\*

**Customs Duties Reduction:** Allow importers and exporters located in foreign trade zone to defer, reduce, or eliminate U.S. Customs duties. Over twenty sites are available in the Los Angeles area.

**Direct Loan Program:** Provides direct loans to businesses and non-profit organizations that manufacture from recycled raw materials, produce new recycled products, or that reduce waste resulting from manufacturing.

**Commercial Solar Incentive Program:** Provides a payment to LADWP customers that purchase and install their own solar power systems. Currently, LADWP also provides an additional incentive payment for systems using PV modules manufactured in the City of Los Angeles. \*\*\*\*

**Smooth Power Program:** Offers both technical assistance and project financing to commercial and industrial customers. \*\*\*\*

**Utility Infrastructure Loan Program:** Provides new and existing DWP customers with short-term, low-cost financing.

**Use Tax Rebate Program:** Businesses that participate in the City's Use Tax Rebate Program can qualify for a rebate of 20% on the additional State collected use tax (67.5%) remitted by the business.

\* Must be located in a State Enterprise Zone (SEZ)

\*\* Must be located in a State Enterprise Zone (SEZ), Federal Empowerment Zone (FEZ), or Renewal Community (RC).

\*\*\* Must be located in Community Redevelopment project area.

## Appendix 3: Tables

### 3.1 Summary Comparison

INCENTIVES	Austin	Boston	Denver	Detroit	Houston	Los Angeles	New York	Portland	Sacramento	San Diego	San Francisco	San Jose	Seattle
<b>Workforce</b>													
Cleantech Workforce Training Program	x	x	x	x		x	x	x	x				
Partnerships with Businesses (for Workforce Development)				x			x	x	x		x	x	
Tax Credits (for New Employees or Types of Jobs Created)		x	x			x	x		x	x	x	x	
<b>Land &amp; Facilities</b>													
Brownfields Redevelopment	x	x	x	x	x	x	x	x	x	x	x	x	x
Property Tax Reduction / Abatement	x			x	x		x	x					
Discounted Utilities						x	x			x			
Other			x			x	x						
<b>Business Environment</b>													
Online Map of Zones/Incentives	x	x	x	x	x	x	x	x		x		x	
Expedited Permitting / One Stop Shop	x	x	x		x		x	x	x	x		x	
Website Extras	x	x	x	x	x		x		x			x	
Business Retention and Relocation Assistance	x	x			x	x	x	x	x		x	x	
Local Purchasing Preference		x		x	x	x		x	x	x	x	x	x

[illegible]

### 3.2 Workforce Programs

Cities	Cleantech Workforce Training Programs	Partnerships with Businesses (for Workforce Development)	Tax Credits (for New Employees or Types of Jobs Created)
Austin, TX	Austin Community College Green Training		
Boston, MA	MA Clean Energy Center		MA Economic Development Incentive Program - 5% investment tax credit in exchange for job creation
Denver, CO	Division of Workforce Development partnership with community colleges		Job Creation Performance Incentive Fund and Enhanced Incentive Program
Detroit, MI	Green Jobs Workforce Training Program	One-Stop Service Centers - workforce development services for employers and job seekers	
Houston, TX			
Los Angeles, CA	Van De Kamp Innovation Center, CD Tech Green Training		CA New Jobs Tax Credit - up to \$3k for each new employee for firms with 20 or less employees
New York, NY	Green Energy Training at City University of New York (CUNY)	NYC Business Solutions Training Funds	Job Creation and Retention Program - discretionary grants for companies creating 75+ jobs in Manhattan  NY State Investment Tax Credits - 3 yr job creation credit of \$1k per employee
Portland, OR	Clean Technology Workforce Training (Oregon Training Network)	Clean Technology Skill Panel	
Sacramento, CA	Greenforce Training Program at Los Rios Community Colleges	CleanTech Enterprise Zone hiring assistance through Sacramento Works!	Work Opportunity Tax Credit  CA New Jobs Tax Credit - up to \$3k for each new employee for firms with 20 or less employees  CleanTech Enterprise Zone wage tax credits for 5 years

Cities	Cleantech Workforce Training Programs	Partnerships with Businesses (for Workforce Development)	Tax Credits (for New Employees or Types of Jobs Created)
San Diego, CA			<p>Work Opportunity Tax Credit</p> <p>CA New Jobs Tax Credit - up to \$3k for each new employee for firms with 20 or less employees</p>
San Francisco, CA		Workforce Investment SF	<p>City of SF Clean Technology Payroll Tax Exemption - For cleantech firms with between 10 and 100 employees, up to 10 years</p> <p>CA New Jobs Tax Credit - up to \$3k for each new employee for firms with 20 or less employees</p>
San Jose, CA		Work2Future program to gear workforce development towards business needs	CA New Jobs Tax Credit - up to \$3k for each new employee for firms with 20 or less employees
Seattle, WA			



### 3.3 Land and Facilities Programs

Cities	Brownfields Redevelopment Program	Property Tax Reduction / Abatement	Discounted Utilities	Other
<b>Austin, TX</b>	Brownfields Redevelopment Program	Reduced property tax for cleantech		
<b>Boston, MA</b>	Brownfield Redevelopment Program			
<b>Denver, CO</b>	Brownfield Redevelopment Program			Neighborhood Business Revitalization loan program
<b>Detroit, MI</b>	Brownfield Redevelopment Program	Obsolete Property Rehabilitation Tax Abatement - functionally obsolete or blighted facilities  Manufacturing and High Technology Facility Tax Abatement - up to 12 yrs		
<b>Houston, TX</b>	Brownfields Redevelopment Program	Reduced property tax for cleantech		
<b>Los Angeles, CA</b>	Brownfield Redevelopment Program		Discounted Electricity & Water Rates for commercial/ industrial customers with conservation programs	Cleantech Corridor, Cleantech Manufacturing Center (CTMC)
<b>New York, NY</b>	Brownfield Redevelopment Program	Commercial Expansion Program, Commercial & Industrial Abatement Program, Industrial Incentive Program	Various discounted energy programs for commercial tenants based on area	Renewable, Clean, & Energy Efficient Production Incentive (up to \$1.5M for CT manufacturers to improve/expand facility)
<b>Portland, OR</b>	Brownfield Redevelopment Program	Commercial Property Redevelopment Program		

Cities	Brownfields Redevelopment Program	Property Tax Reduction / Abatement	Discounted Utilities	Other
Sacramento, CA	Brownfield Redevelopment Program			
San Diego, CA	Brownfield Redevelopment Program		SDGE On-Bill 0% financing for energy efficient business improvements	
San Francisco, CA	Brownfield Redevelopment Program			
San Jose, CA	Brownfield Redevelopment Program			
Seattle, WA	Brownfield Redevelopment Program			

### 3.4 Business Environment Programs

Cities	Online Maps of Zones/Incentives	Expedited Permitting / One Stop Shop	Website Extras	Business Retention and Relocation Assistance	Local Purchasing Preference
<b>Austin, TX</b>	Interactive GIS maps of zones	Expedited Development Process	Chamber of Commerce Property search, (Clean Energy section, demographic and cost comparisons, incentives)	TX Manufacturing Assistance Center	
<b>Boston, MA</b>	PDF maps of zones	Expedited permitting	Property locator, GreenTech Boston web section	Create Boston \$150K loans for businesses locating in Boston	Tie-bid preference for MA manufacturers
<b>Denver, CO</b>	Interactive GIS maps of zones and business incentive target areas	Waiver of permit fees	Interactive GIS property search, extensive demographics, incentives section		
<b>Detroit, MI</b>	Maps of zones from Economic Growth Corp.		Property search, extensive demographics, incentives section		10% preference if under \$10k, 1% for over \$10K
<b>Houston, TX</b>	Interactive GIS map with companies by sector	Houston One- Stop Shop	Incentives section, demographics	TX Manufacturing Assistance Center	Reciprocal Preference
<b>Los Angeles, CA</b>	GIS - Zone Information Map Access System			New business tax exemption for 2 years (gross receipts under \$500k)	10% preference for small businesses in the County for contracts < \$100k
<b>New York, NY</b>	Interactive GIS Map with incentives and zoning	Expedited Permitting - NYC Business Express	"Incentives Finder" and wizard, green incentives section, demographics	Relocation Employment Assistance Program	
<b>Portland, OR</b>	Maps of zones and incentives, and property information	Portland Best Business Center 1 stop shop for green firms		Business Retention Program	Procurement for targeted industries

Cities	Online Maps of Zones/Incentives	Expedited Permitting / One Stop Shop	Website Extras	Business Retention and Relocation Assistance	Local Purchasing Preference
<b>Sacramento, CA</b>		Expedited Permitting via Development Services Dept.	Website - site selection	Business Retention (Metro Pulse)	Local Vendor Preference 3%
<b>San Diego, CA</b>	Maps of zones, incentives, firms	Streamlined Permitting			2% preference for small and emerging local businesses
<b>San Francisco, CA</b>				Business Relocation Assistance; Business Retention Program	5% preference for local businesses, plus 5% if MBE/WBE
<b>San Jose, CA</b>	Searchable property parcels	All Permitting Online	Website	Business Retention Program	2.5% preference for local businesses. 5% for small, local businesses.
<b>Seattle, WA</b>					2% preference for local businesses. 5% preference for MBE/WBE.

### 3.5 Financing and Funding Programs

Cities	Federal Zones Incentives	State Zone Incentives	Loan Funds	Tax Credit / Rebate / Exemption	Industrial Development Bonds
<b>Austin, TX</b>		Texas Enterprise Zone	TX Small Business Loan Fund; TX Product Development Fund; TX Enterprise Fund; TX Emerging Technology Fund	Sales tax exemption for manufacturers  Franchise tax exemption for solar manufacturers	TX Industrial Revenue Bonds
<b>Boston, MA</b>	Empowerment Zone	Massachusetts Enterprise Zone	Boston BackStreets Initiative (loans for industrial/ manufacturing firms)  MA Emerging Technology Fund  MA Renewable Energy Trust SEED: convertible loans up to \$500k	MA Investment Tax Credit for manufacturing equipment	
<b>Denver, CO</b>		Colorado Enterprise Zone	Denver Revolving Loan Fund program		
<b>Detroit, MI</b>	Empowerment & Renewal Community Zones	Michigan Renaissance Zone	Small Business Loan Transaction Program (max \$200k); Detroit Community Loan Fund (\$50-250k); Detroit Industrial Revolving Loan Fund	Michigan Economic Growth Authority (business tax credit for manufacturing and high-tech)	Industrial Revenue Bonds
<b>Houston, TX</b>		Texas Enterprise Zone; Competitive Renewable Energy Zone	TX Small Business Loan Fund; TX Product Development Fund; TX Enterprise Fund; TX Emerging Technology Fund	Sales tax exemption for manufacturers  Franchise tax exemption for solar manufacturers	TX Industrial Revenue Bonds
<b>Los Angeles, CA</b>	Empowerment & Renewal Community Zones	California Enterprise Zones (East LA and Hollywood)	Loans for businesses that manufacture from recycled raw materials	Use tax rebates	Industrial Development Bonds

Cities	Federal Zones Incentives	State Zone Incentives	Loan Funds	Tax Credit / Rebate / Exemption	Industrial Development Bonds
New York, NY	Empowerment Zone	Empire Zone	NYSEED - funds for seed-stage companies  NYCEDC Entrepreneurial Investment Fund - \$20-\$200k angel investments for startups	Qualified Advanced Energy Investment Tax Credit - for manufacturing facilities that produce renewable energies	Industrial Development Bonds; CRC/Nimble Small Issuance Bond Program; Manufacturing Facilities Bond Program
Portland, OR	Enterprise Community Zone	Oregon Enterprise Zone	Northwest Small Business Finance Corporation; OR Business Development Fund; OR Energy Loan Program	OR Business Energy Tax Credits - for manufacturing renewable energy components	Industrial Development Bonds
Sacramento, CA		California Enterprise Zone (rebranded as Cleantech Enterprise Zone)	EnterFund for small businesses and startups		Industrial Development Bonds
San Diego, CA	Renewal Community Zone	California Enterprise Zone	Regional Revolving Loan Fund - gap financing \$150-\$500k  Small Business Micro Revolving Loan Fund - gap financing \$25-150k		Industrial Development Bonds
San Francisco, CA	Renewal Community Zone	California Enterprise Zone	Small Business Revolving Loan Fund for \$5-50k loans - City-launched and administered by nonprofit		
San Jose, CA	Empowerment & Renewal Community Zones	California Enterprise Zone	San Jose Catalyst Fund for business training and development assistance		
Seattle, WA		Washington Community Empowerment Zones	Grow Seattle Fund for small and medium sized businesses		

### 3.6 Industry Clustering Programs

Cities	Cleantech Incubators	Tax Credit / Rebate / Exemption (Industry-specific)	Grants / Awards (industry-specific)	Cleantech Staff	Partnership with Regional Cleantech Network
<b>Austin</b>	Austin Clean Energy Incubator	TX Sales tax exemption for manufacturing equipment  TX Solar Energy Services Business Franchise Tax Exemption		Director of Clean Energy Initiatives (Chamber of Commerce)	
<b>Boston, MA</b>	Clean Innovation Fusion Center; Wind Technology Innovation Center	MA Investment Tax Credit for manufacturing equipment; Single Sales Factor		Green Tech Business Manager (economic development liaison acts as 1 stop shop for cleantech firms)	New England Clean Energy Council
<b>Denver, CO</b>	CleanLaunch Technology Incubator				
<b>Detroit, MI</b>	TechTown Incubator	Michigan Economic Growth Authority - tax credit against MI business tax for manufacturing and high-tech			
<b>Houston, TX</b>	Houston Technology Incubator	Sales tax exemption for manufacturers  Franchise tax exemption for solar manufacturers			
<b>Los Angeles, CA</b>	Planned Incubator with DWP (in development)				CleanTech LA

Cities	Cleantech Incubators	Tax Credit / Rebate / Exemption (Industry-specific)	Grants / Awards (industry-specific)	Cleantech Staff	Partnership with Regional Cleantech Network
New York, NY		Qualified Advanced Energy Investment Tax Credit - for manufacturing facilities that produce solar, renewable energy, etc.	Renewable, Clean and Energy Efficient Production Incentive  Industrial Process & Product Innovation - for innovative tech that provides energy benefits, up to \$400k  Manufacturing Assistance Program awards up to \$1m		New York CleanTech Corridor
Portland, OR	Portland State Business Accelerator	OR Business Energy Tax Credits - for manufacturing renewable energy components		Portland Bureau of Development Services Small Business Liaison	OR Sustainable Economy Network
Sacramento, CA					Green Capital Alliance
San Diego, CA				Cleantech Initiative liaison	CleanTech SD
San Francisco, CA	Planned Incubator at Hunter's Point (in development)			Office of Economic and Workforce Development - Clean Technology and Green Business liaison	
San Jose, CA	Environmental Business Cluster			Clean Technology Officer	
Seattle, WA					Enterprise Seattle; Washington Cleantech Alliance



3.7 Transportation Systems Programs

Cities	Tax Credits (Exemptions for Ports)	US Customs Duties Reduction / Elimination
Austin, TX		Foreign Trade Zone
Boston, MA		Foreign Trade Zone
Denver, CO		Foreign Trade Zone
Detroit, MI		Foreign Trade Zone
Houston, TX	Houston Freeport Tax Exemption for ports	Foreign Trade Zone
Los Angeles, CA		Foreign Trade Zone
New York, NY		Foreign Trade Zone
Portland, OR		Foreign Trade Zone
Sacramento, CA		Foreign Trade Zone
San Diego, CA		Foreign Trade Zone
San Francisco, CA		Foreign Trade Zone
San Jose, CA		Foreign Trade Zone
Seattle, WA		Foreign Trade Zone

### 3.8 Cleantech Specific Wage Information

May 2008 OES for MSAs <sup>ix</sup>	Austin - Roundrock	Boston - Cambridge - Quincy	Denver - Aurora	Detroit - Warren - Livonia	Houston - Sugar Land - Baytown	LA-LongBeach-Santa Ana	NY -New Jersey -Long Island	Portland - Vancouver - Beaverton	Sacramento-Arden-Arcade-Roseville	San Diego - Carlsbad - San Marcos	SF - Oakland - Fremont	San Jose - Sunnyvale - Santa Clara	Seattle - Tacoma - Bellevue
<b>Team Assemblers</b>													
<b>Employment</b>	3,320	9,380	4,770	16,890	20,660	36,710	24,570	5,220	2,320	10,490	8,290	6,550	8,550
<b>Median Hourly</b>	\$11.56	\$13.31	\$12.79	\$13.29	\$10.60	\$10.89	\$10.43	\$13.04	\$12.26	\$11.23	\$13.09	\$13.06	\$14.14
<b>Mean Hourly</b>	\$12.04	\$14.00	\$12.91	\$14.02	\$11.08	\$12.05	\$11.92	\$13.72	\$13.08	\$11.91	\$14.32	\$13.58	\$14.84
<b>Mean Annual</b>	\$25,050.00	\$29,130	\$26,850	\$29,160	\$23,050	\$25,070	\$24,800	\$28,540	\$27,210	\$24,770	\$29,780	\$28,240	\$30,880
<b>Electrical and Electronic Equipment Assemblers</b>													
<b>Employment</b>	4,280	7,600	1,430	2,280	4,820	9,180	8,180	7,080	600	2,330	2,620	5,130	4,510
<b>Median Hourly</b>	\$11.82	\$15.39	\$12.76	\$14.09	\$12.67	\$11.86	\$13.87	\$12.99	\$11.76	\$12.03	\$14.57	\$15.31	\$14.22
<b>Mean Hourly</b>	\$12.54	\$15.90	\$13.91	\$15.20	\$13.06	\$12.88	\$14.77	\$13.51	\$12.71	\$13.04	\$15.61	\$17.41	\$14.97
<b>Mean Annual</b>	\$26,080	\$33,070	\$28,920	\$31,620	\$27,160	\$26,780	\$30,720	\$28,090	\$26,440	\$27,110	\$32,470	\$36,210	\$31,130
<b>Engine &amp; Other Machine Assemblers</b>													
<b>Employment</b>		130			640	690	430	280			90		
<b>Median Hourly</b>		\$18.67	\$13.86		\$15.04	\$14.99	\$15.96	\$15.61		\$14.51	\$21.85	\$11.65	
<b>Mean Hourly</b>		\$19.30	\$14.05		\$15.78	\$15.77	\$16.22	\$15.85		\$14.81	\$20.60	\$11.87	

<sup>ix</sup> Data included from the U.S. Bureau of Labor Statistics Occupational Employment Statistics database at the relevant Metropolitan Statistical Areas (MSAs) as available. Empty cells denote missing or unavailable information.

May 2008 OES for MSAs <sup>ix</sup>	Austin - Roundrock	Boston - Cambridge - Quincy	Denver - Aurora	Detroit - Warren - Livonia	Houston - Sugar Land - Baytown	LA-LongBeach-Santa Ana	NY -New Jersey -Long Island	Portland - Vancouver - Beaverton	Sacramento-Arden- Arcade-Roseville	San Diego - Carlsbad - San Marcos	SF - Oakland - Fremont	San Jose - Sunnyvale - Santa Clara	Seattle - Tacoma - Bellevue
<b>Mean Annual</b>		\$40,150	\$29,220		\$32,830	\$32,800	\$33,750	\$32,970		\$30,800	\$42,850	\$24,690	
<b>Engineers, All Other</b>													
<b>Employment</b>	390	3,920		16,370	5,830	15,620	3,570	1,160	1,820	3,740	4,310	4,850	5,810
<b>Median Hourly</b>	\$43.82	\$45.33	\$46.59		\$48.69	\$47.00	\$44.61	\$41.85	\$44.42	\$44.25	\$46.37	\$50.97	\$44.50
<b>Mean Hourly</b>	\$43.57	\$44.98	\$46.00		\$48.79	\$47.58	\$43.95	\$43.15	\$43.87	\$44.71	\$47.34	\$52.21	\$43.58
<b>Mean Annual</b>	\$90,620	\$93,550	\$95,670		\$101,490	\$98,960	\$91,420	\$89,750	\$91,250	\$93,000	\$98,470	\$108,590	\$90,650
<b>Electrical Engineers</b>													
<b>Employment</b>	2,220			3,370	4,200	6,110	7,700	1,510	990	170	2,740	5,300	2,040
<b>Median Hourly</b>	\$45.62	\$47.42	\$39.07	\$37.55	\$44.54	\$42.31	\$41.88	\$40.64	\$45.89	\$43.62	\$44.35	\$50.45	\$39.07
<b>Mean Hourly</b>	\$27.37	\$48.86	\$39.48	\$38.67	\$45.84	\$42.51	\$43.70	\$41.65	\$52.86	\$45.31	\$44.66	\$50.76	\$39.84
<b>Mean Annual</b>	\$98,530	\$101,630	\$82,120	\$80,420	\$95,340	\$88,420	\$90,910	\$86,640	\$109,950	\$94,250	\$92,900	\$105,570	\$82,860

### 3.9 Cleantech Specific Industry Information

QCEW 2008 Annual Average <sup>x</sup>	Austin - Roundrock	Boston - Cambridge - Quincy	Denver - Aurora	Detroit - Warren - Livonia	Houston - Sugar Land - Baytown	L.A-LongBeach-Santa Ana	NY-New Jersey -Long Island	Portland - Vancouver - Beaverton	Sacramento-Arden-Arcade-Roseville	San Diego - Carlsbad - San Marcos	SF - Oakland - Fremont	San Jose - Sunnyvale - Santa Clara	Seattle - Tacoma - Bellevue
<b>General Manufacturing</b>													
<b>NAICS 3**** Manufacturing Employment</b>	58,089	199,200		233,624	240,792	605,391		122,867	38,002	102,258	135,330	167,729	185,348
<b>NAICS 3**** Manufacturing Establishments</b>	1,437	5,251	2,735	6,352	6,081	19,815	19,166	3,429	1,513	3,119	4,365	2,740	3,884
<b>Location Quotient for 3****, base US total employment</b>	0.81	0.8		1.24	0.93	1.04		1.17	0.48	0.79	0.65	1.71	1.07
<b>Average Annual Wages</b>	\$81,391	\$74,670		\$67,316	\$71,915	\$56,532		\$60,809	\$60,476	\$65,309	\$81,092	\$119,881	\$69,761
<b>NAICS 334413 Semiconductor Manufacturing</b>													
<b>NAICS 334413 Semiconductors Employment</b>	12,478				1,499	8,799	3,986	1,945	1,092	2,678	3,879	29,062	
<b>NAICS 334413 Semiconductor Establishments</b>	58	67	16	5	14	103	73	83	13	39	56	268	10

<sup>x</sup> Data included from the U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages database at the relevant Metropolitan Statistical Areas (MSAs) as available. Empty cells denote missing or unavailable information.

QCEW 2008 Annual Average <sup>x</sup>	Austin - Roundrock	Boston - Cambridge - Quincy	Denver - Aurora	Detroit - Warren - Livonia	Houston - Sugar Land - Baytown	L.A-LongBeach-Santa Ana	NY-New Jersey -Long Island	Portland - Vancouver - Beaverton	Sacramento-Arden-Arcade-Roseville	San Diego - Carlsbad - San Marcos	SF - Oakland - Fremont	San Jose - Sunnyvale - Santa Clara	Seattle - Tacoma - Bellevue
% Mfg that's NAICS 334413	27.43%				0.62%	1.45%		5.23%	2.87%	2.62%	2.87%	17.33%	
Location Quotient for 334413, base US total employment	14.98				0.37	0.98	0.31	2.79	0.9	1.33	1.21	19.13	
Average Annual Wages					\$128,837	\$90,562	\$80,438		\$68,755	\$102,022	\$90,188	\$142,076	
<b>NAICS 3359** Other Electrical Equipment and Component Mfg (including batteries, electrical connections, etc)</b>													
NAICS 3359** Other Elect. Eqt. Mfg. Employment	389	3,539		647	2,196	5,040	4,639	1,027	231	1,584			
NAICS 3359** Other Elect. Eqt. Mfg. Establishments	7	64	21	32	35	145	132	19	10	39	32	39	19
% Mfg that's NAICS 3359**	0.67%	1.78%		0.28%	0.91%	0.83%		0.84%	0.61%	1.55%			
Location Quotient for 3359**, base US total employment	0.52	1.39		0.34	0.83	0.85	0.55	0.96	0.29	1.2			
Average Annual Wages	\$56,965	\$61,322		\$64,854	\$62,490	\$61,241	\$64,524	\$52,910	\$56,393	\$52,291			
<b>NAICS 336*** Transportation Equipment Manufacturing</b>													
NAICS 336*** Trans. Equipt. Mfg. Employment	167	13,152	7,874	99,947	9,139	65,996	10,833	5,974	3,121	15,407	8,177		86,492
NAICS 336*** Trans. Equipt. Mfg. Establishments	30	95	99	660	156	853	323	133	54	167	89	28	290
% Mfg that's NAICS 336***	0.37%	6.60%		42.78%	3.80%	10.90%		16.07%	8.21%	15.07%	6.04%		46.66%
Location Quotient for 336***, base US total employment	0.03	0.44	0.52	4.41	0.29	0.95	0.11	1.11	0.33	0.99	0.33		4.15
Average Annual Wages		\$96,263	\$90,361	\$83,041	\$61,328	\$78,790	\$66,236		\$64,555	\$64,916	\$74,487		\$85,761

### 3.10 Los Angeles Trends in Manufacturing

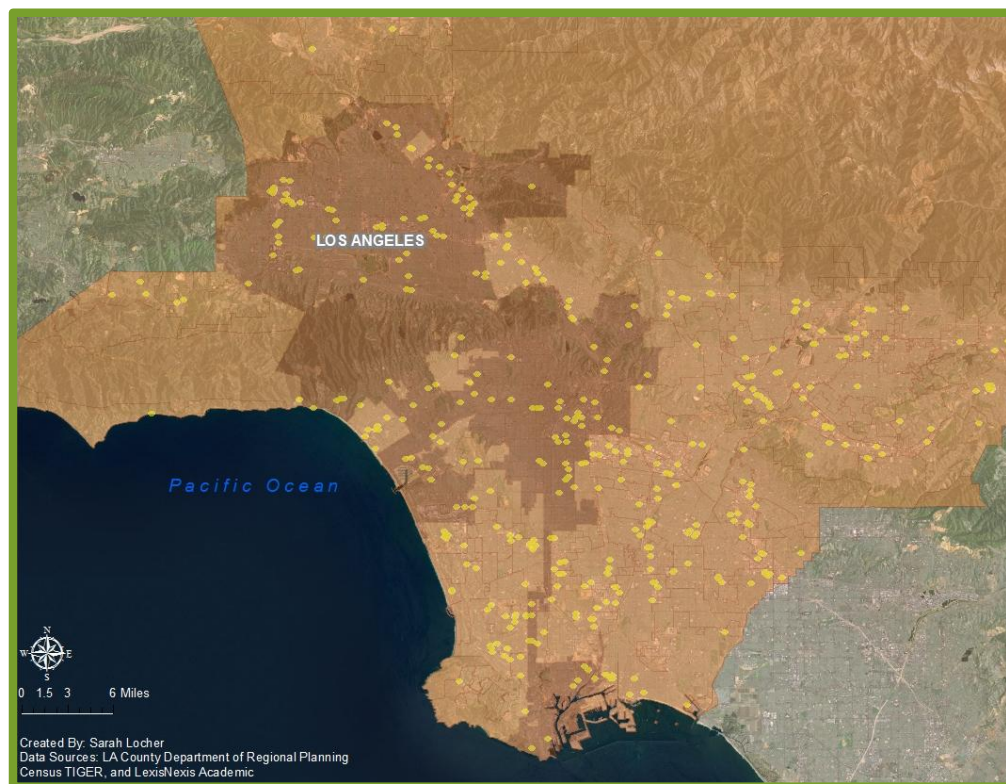
U.S. Quarterly Census of Employment and Wages LA-LongBeach-Santa Ana MSA	2003	2004	2005	2006	2007	2008	Percent Change (2003 to 2008)
<b>General Manufacturing</b>							
NAICS 3**** Manufacturing Employment	678929	664460	649454	644902	622501	605391	10.83%
NAICS 3**** Manufacturing Establishments	23850	22858	21538	21290	20348	19815	16.92%
<b>NAICS 334413 Semiconductor Mfg.</b>							
NAICS 334413 Semiconductors Employment	9226	8891	10082	10132	9642	8799	4.63%
NAICS 334413 Semiconductors Establishments	132	117	139	133	109	103	21.97%
<b>NAICS 3359** Other Electrical Equipment and Component Mfg (including batteries, electrical connections, etc)</b>							
NAICS 3359** Other Elect. Eqt. Mfg. Employment	6800	6148	6266	5582	5443	5040	25.88%
NAICS 3359** Other Elect. Eqt. Mfg. Establishments	162	157	160	154	143	145	10.49%
<b>NAICS 336*** Transportation Equipment Manufacturing</b>							
NAICS 336*** Trans. Equipt. Mfg. Employment	71532	71016	68985	68945	64367	65996	7.74%
NAICS 336*** Trans. Equipt. Mfg. Establishments	978	937	892	884	868	853	12.78%
<b>NAICS 3364** Aerospace Parts &amp; Products Manufacturing</b>							
NAICS 3364** Aerospace Mfg. Employment	50378	50981	49875	51368	48530	49632	1.48%
NAICS 3364** Aerospace Mfg. Establishments	412	409	397	395	400	395	4.13%

## Appendix 4: Maps

The following maps examine firms within the Los Angeles County region with potential relevancy to solar and electric vehicle manufacturing. All firm data was collected for LexisNexis Academic company dossiers for firms and it thus subject to the accuracy of that data as of March 2010. Firms represent the following NAICS codes:

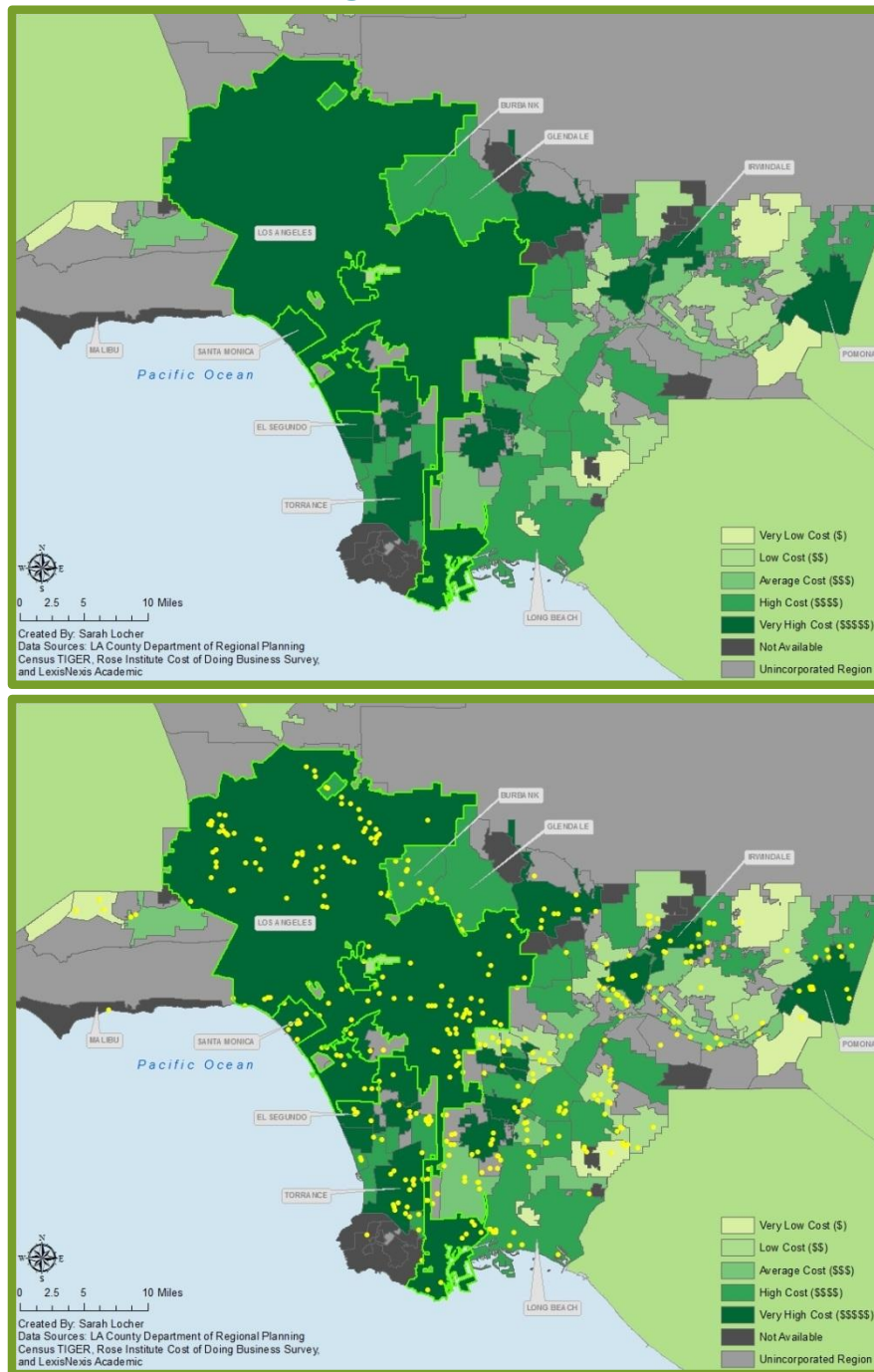
<i>334413:</i>	Semiconductor and Related Device Manufacturing
<i>3359**:</i>	Other Electrical Equipment and Component Manufacturing
<i>336*** (SPECIFICALLY 3361**, 3362**, AND 3363**):</i>	Transportation Equipment Manufacturing, specifically Motor Vehicle Manufacturing, Motor Vehicle Body & Trailer Manufacturing, and Motor Vehicle Parts Manufacturing

### Appendix 4.1 Firms in LA County





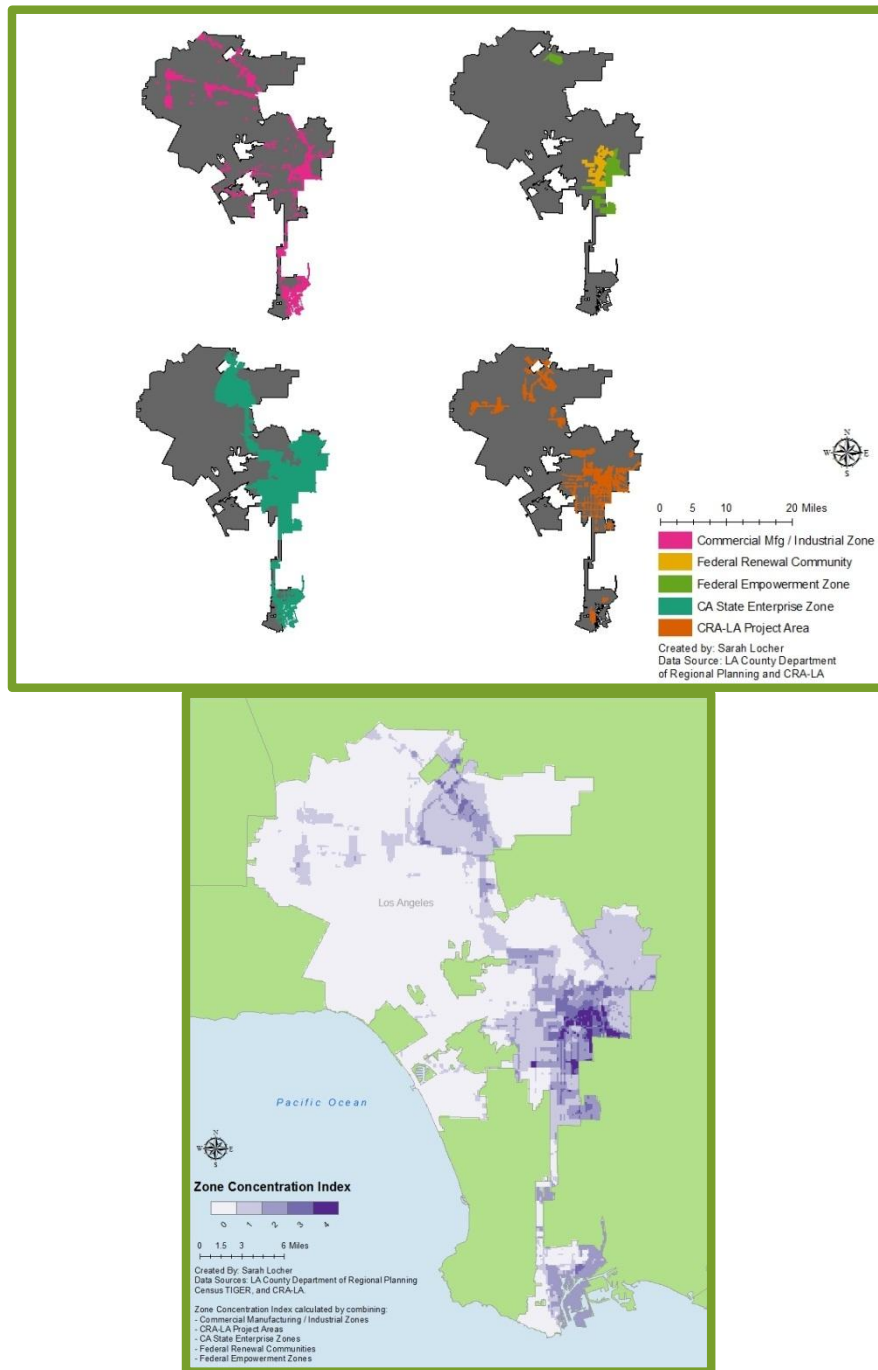
## Appendix 4.2 Cost of Doing Business



The maps above reflect the location of firms in relation to the Kosmont-Rose Institute's 2009 "Cost of Doing Business" rankings amongst Los Angeles County cities.<sup>129</sup> Regionally, firm location does not appear to clearly correlate with the costliness of each city.

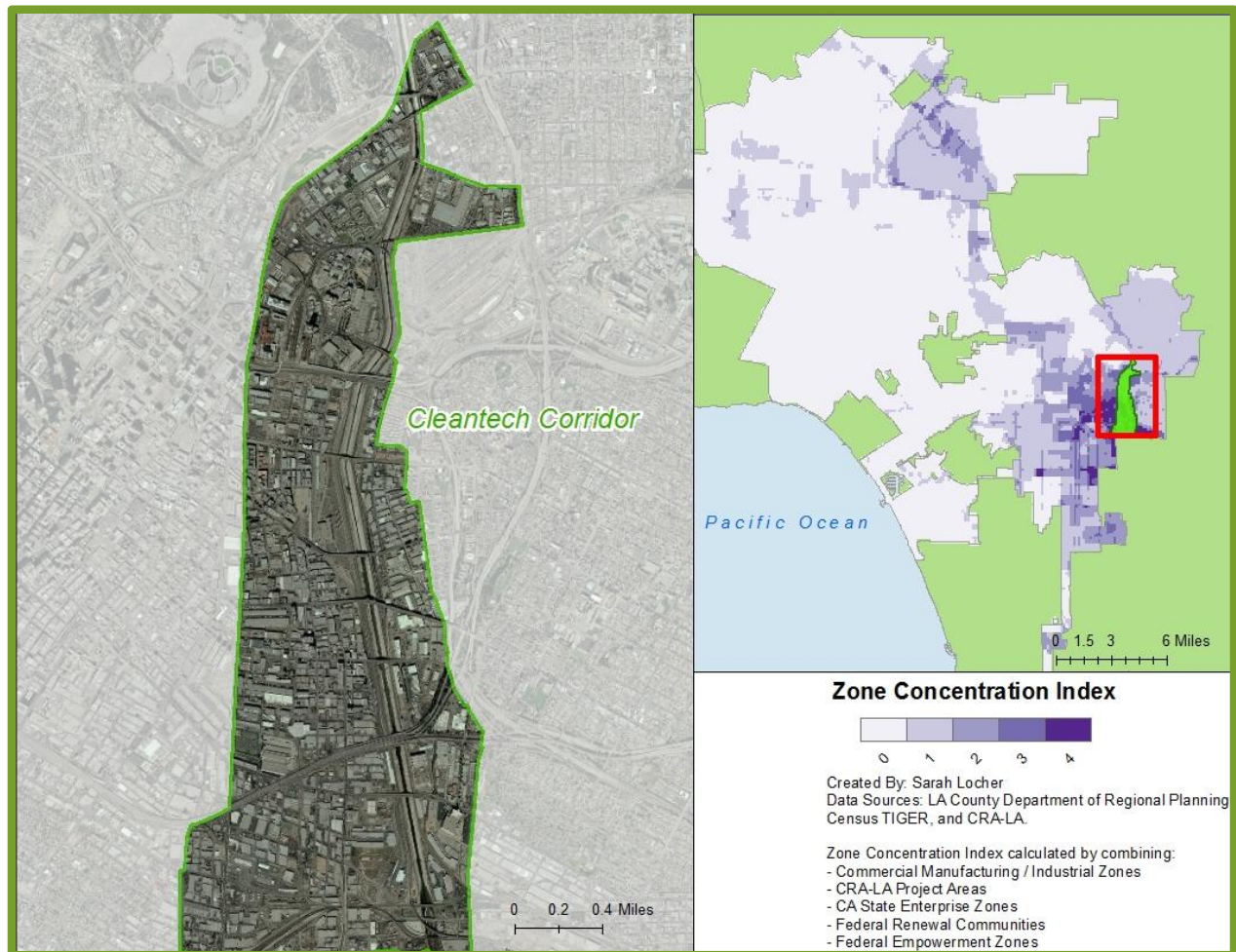


## Appendix 4.3 Los Angeles Incentive Zones



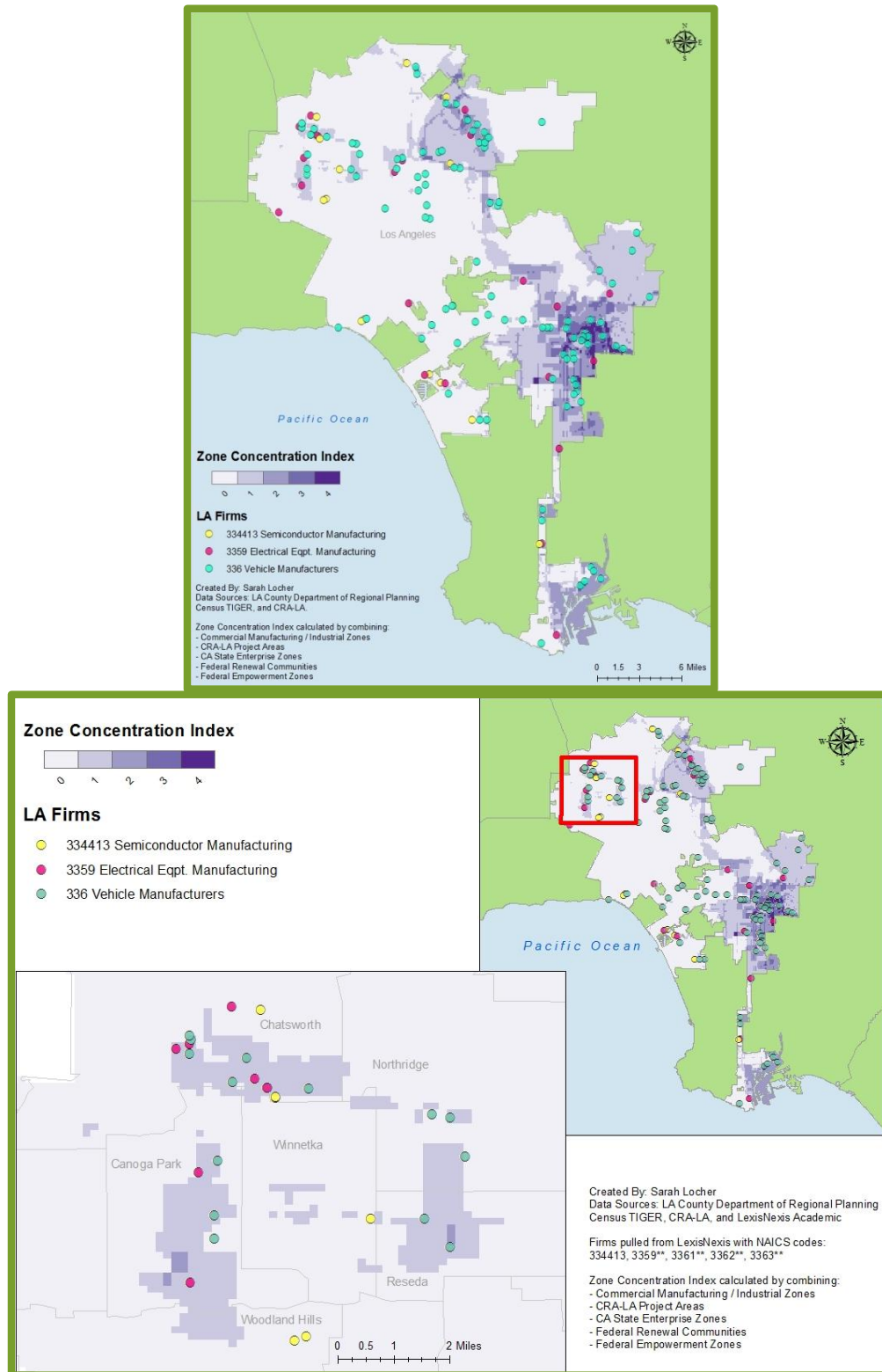
These maps indicate the overlapping industrial and commercial manufacturing zones, CRA/LA project areas, state enterprise zones, federal renewal communities, and federal empowerment zones in Los Angeles.

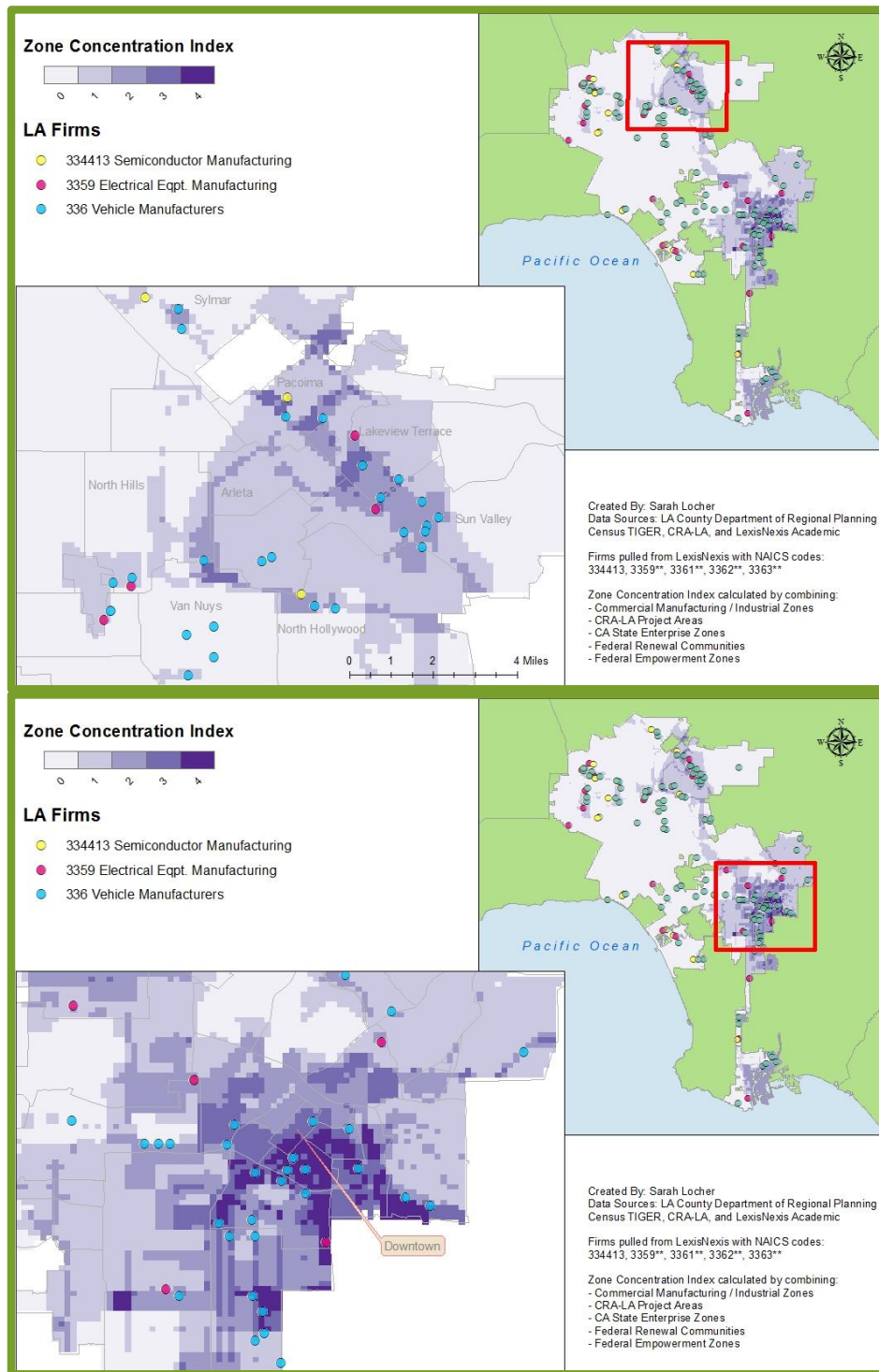
## Appendix 4.4 Incentive Zones and the Cleantech Corridor



The designated Cleantech Corridor is located at the highest concentration of local, state, and federal zones.

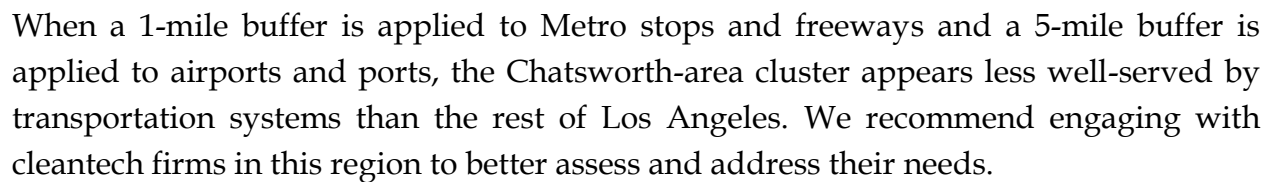
## Appendix 4.5 Firm Location and Zone Concentration



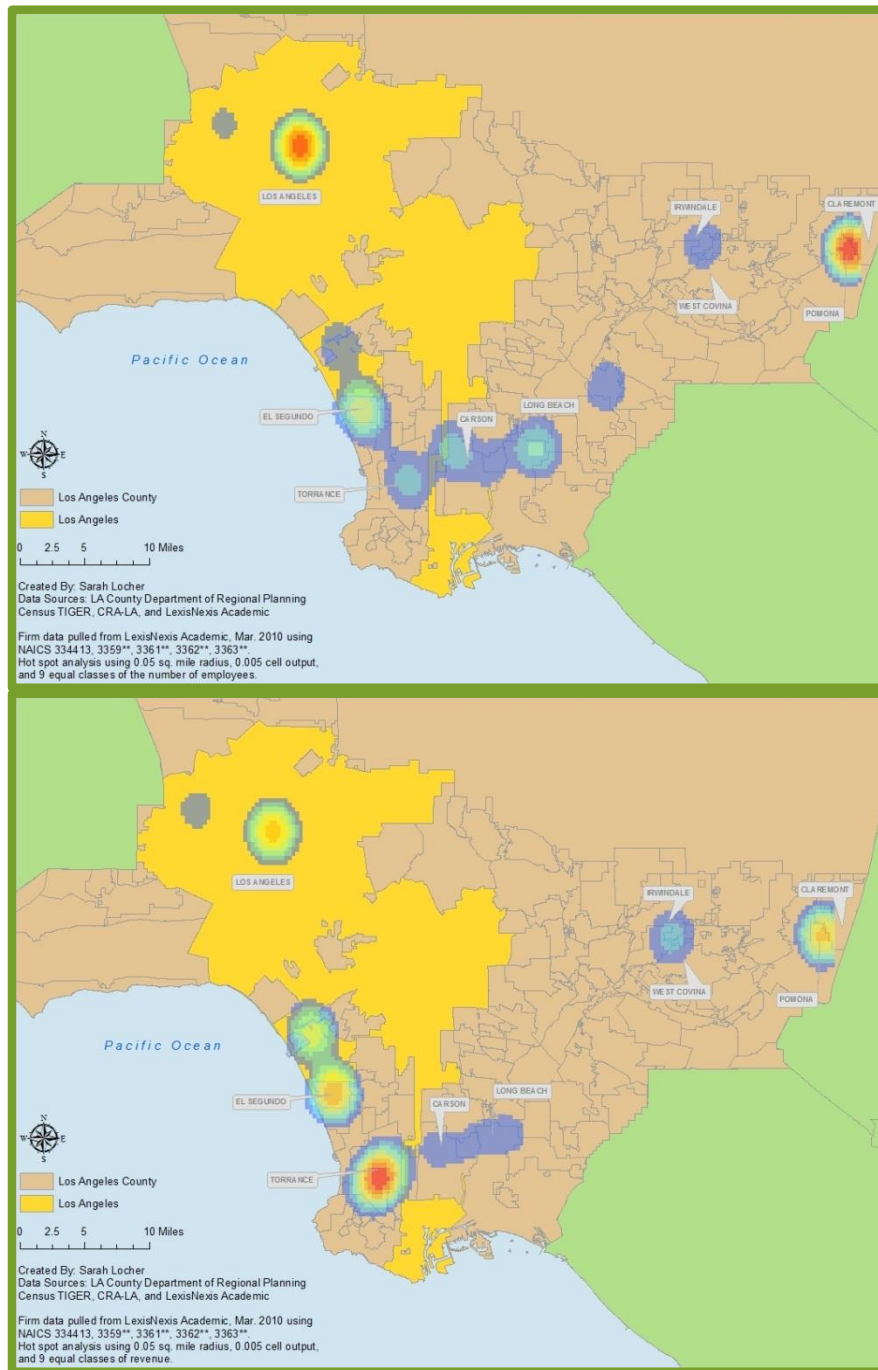


Small clusters appear to be burgeoning near Chatsworth-Canoga Park, Downtown, and Van Nuys-Lakeview Terrace. These clusters should be addressed, and possibly targeted for relocation to the Cleantech Corridor region. Innovative semiconductor and electrical equipment firms could specifically be targeted for the Downtown region.





## Appendix 4.7 Hot Spot Analysis



The maps above depict the areas with the highest concentration of revenue and employees, respectively. This is dependent on the accuracy of LexisNexis data and may appear skewed due to the fact that some firms are substantially larger than most.

## Appendix 5. Interview List

Interviewee	Title	Organization	Interview Date
<b>Mayor's Office</b>			
Sean Arian	Director of Economic Development Strategy	Mayor's Office	On-Going/Multiple
David Libatique	LADWP Liason	Mayor's Office	February 19, 2010
Romel Pasqual	Interim Deputy Mayor for Energy and the Environment	Mayor's Office	On-Going/Multiple
Alex Fay	Clean Tech Liason	Mayor's Office	On-Going/Multiple
Gabriel Sermeno	Business Team Representative	Mayor's Office	On-Going/Multiple
Helen Beckon	Former Bohnett Fellow	Mayor's Office	On-Going/Multiple
<b>CRA/LA</b>			
Alex Paxton	Manager of Policy Analysis	CRA/LA	On-Going/Multiple
Jenna Gulager	Assistant Project Manager	CRA/LA	January 5, 2010
<b>LADWP</b>			
David Freeman	Interim General Manager	LADWP	June 2009
Kathy Irish	Economic Development Manager	LADWP	January 15, 2010
<b>UCLA</b>			
Uday Karmarkar	Professor	UCLA Anderson School of Management	March 5, 2010
Allen Scott	Professor	UCLA School of Public Affairs	January 2010
<b>Cleantech Firms</b>			
Robert Hertzberg	C.E.O., former L.A. City Councilmen, and former CA State Assembly Member	G24 Innovations	January 27, 2010
Stella Li	General Manager of BYD North America	BYD Auto	On-Going / Multiple

Interviewee	Title	Organization	Interview Date
n/a	Sales Rep	Akeena Solar	January 2010
Mark Jarel	Sales Rep	TEU	January 2010
<b>Other</b>			
Jack Kyser	Chief Economist	Los Angeles Economic Development Corporation	March 8, 2010
Sarah Potts	L.A. City Director	Clinton Climate Initiative	On-Going/Multiple



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<sup>6</sup> Ibid., 15.

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<sup>8</sup> Ibid., 7.

<sup>9</sup> Ibid., 30.

<sup>10</sup> Bureau of Economic Analysis, "Regional Economic Accounts"; available from <http://www.bea.gov/regional/gdpmetro/>; Internet; accessed 1 March 2010.

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