THE EFFECTS OF CALIFORNIA'S ENERGY POLICY ON OPPORTUNITY IN LOS ANGELES COUNTY

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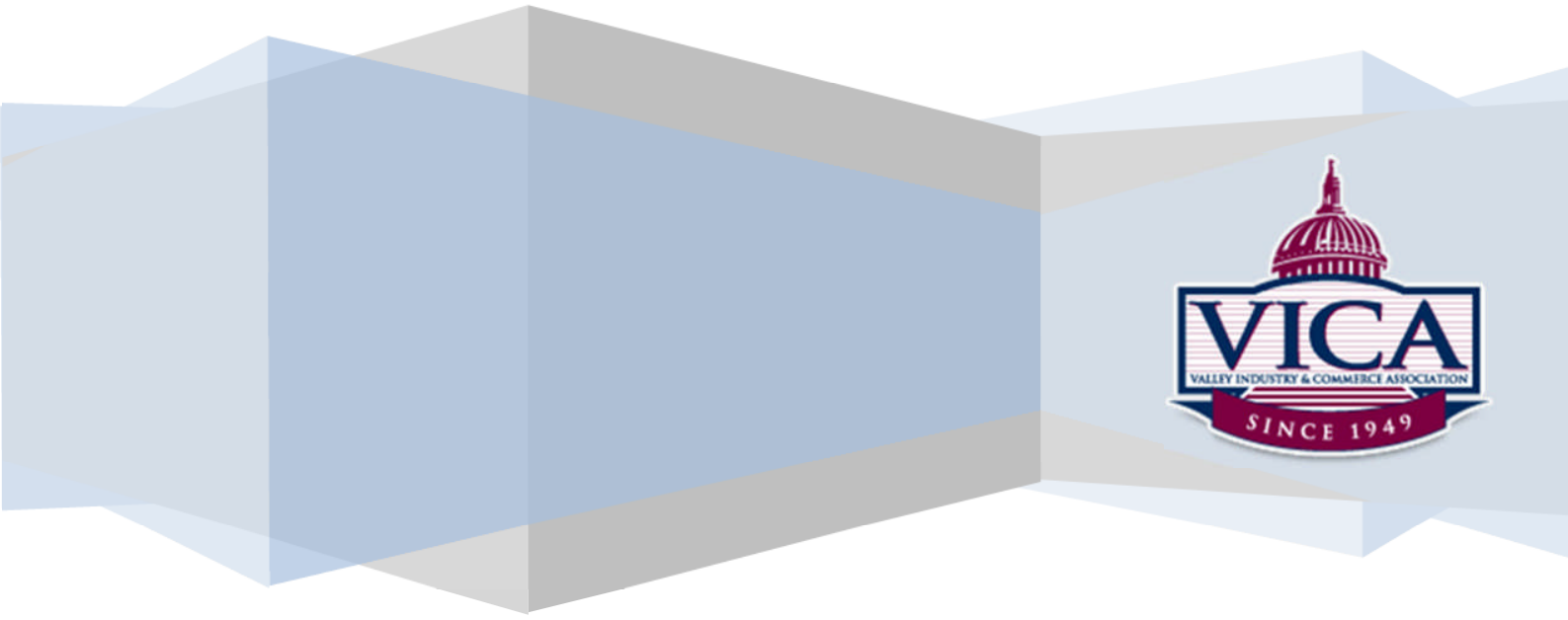

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EXECUTIVE SUMMARY

Los Angeles County has a unique history as a place of opportunity and growth—of providing a wide range of opportunity for people of all backgrounds, educational levels, and income groups. It is particularly famous as an engine of opportunity for the middle class—it is iconic as a place of suburbs clustered around suburbs. The absence of a core city center around which all regional activity is clustered is a testament to the overwhelming rise of a middle class who desired the relative space and distance that the suburban experience provides.

This history of opportunity, however, is under pressure today. That pressure comes in two forms: (1) external political and economic trends which have changed the context of the opportunity economy; and (2) cost pressures created by a mounting wave of public policy choices and alternatives—most recently caused by the state's new energy policies. While the Los Angeles economy as a whole is moving lethargically out of the Great Recession, the pressure is particularly intense for the key components of its economic infrastructure that provide the greatest upward income mobility to lower wage and less educated workers—what this study calls the "opportunity economy." This analysis looks in detail at these sectors of the Los Angeles County economic engine and examines their vulnerability to the rising energy prices resulting from a series of state policy initiatives energy initiatives, including AB 32 and the state's Renewable Portfolio Standards.

OPPORTUNITY AND THE LOS ANGELES COUNTY ECONOMY

People came to Los Angeles to get ahead—to pursue the Golden Dream of the middle class. Skilled and unskilled alike live and migrate here knowing if they are willing to work hard, they can climb into the middle class (or higher) and enjoy the quality of life that came with it. Opportunity in Los Angeles came in two forms: opportunity for the next generation through access to decent (usually suburban schools) and through excellent institutions of higher education; and opportunity for this generation through a rich inventory of jobs where low skill workers could start at the bottom and work their way up. This latter group of opportunities is the focus of this study.

These opportunity sectors are those for which the wages are sufficient that they can serve as the anchor for a middle class lifestyle (approximately $40,000) and ones that have relatively low educational requirements at the entry level. In Los Angeles County today, these opportunity sectors are clustered in three main industry areas:

(1) manufacturing;

(2) trade, transportation and warehousing; and

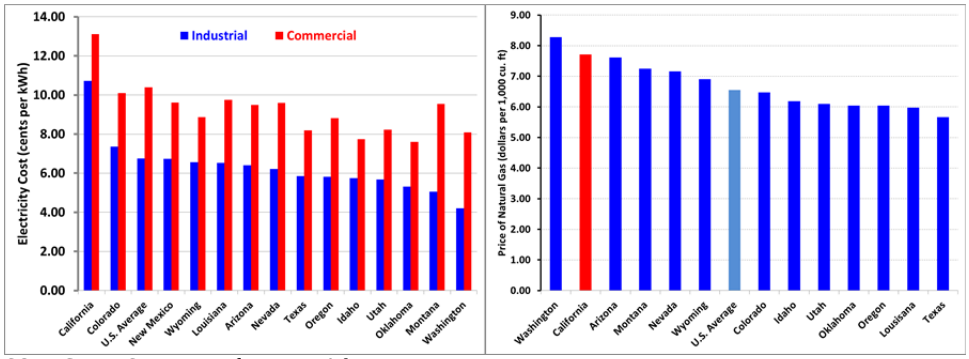
(3) construction.

While these sectors are critical to the region, each one of them is already under pressure from significant external pressures. Details about findings in each of these areas are discussed below, but first it is important to understand the key reasons why energy costs are rising and expected to spiral upward under the state's Renewable Portfolio Standards (RPS) and its implementation of AB 32.

KEY FINDINGS ABOUT ENERGY COSTS

Los Angeles County and California already have some of the highest energy costs in the United States. Exhibit ES-1 shows how that California has the highest electricity prices and the second highest natural gas prices in the western United States.

Exhibit ES-1—Cost of Electricity *(left panel-April 2014)* and Cost of Natural Gas *(right panel-February 2014)*, Selected States



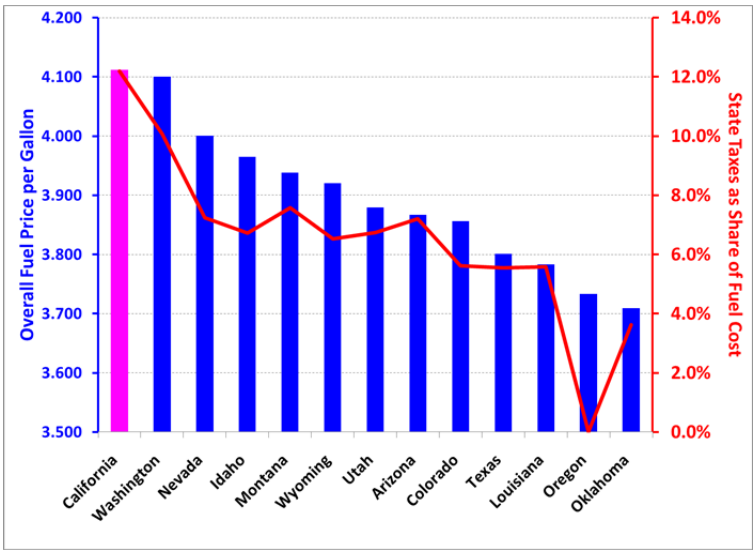
SOURCE: U.S. Energy Information Administration.

Adding to these already-high prices are the pressures that emerge from the implementation of AB 32 and the state's Renewable Portfolio Standards which will, over time require the state to purchase growing levels of energy from renewable, but frequently more expensive, sources.

Additionally, gasoline, diesel and other fuel prices are also likely to be significantly impacted under the implementation of the AB 32, especially as they are folded into the cap-and-trade markets in 2015. Current estimates expect this process to immediately increase gasoline, diesel and other fuel costs by 20 to 76 cents per gallon, with the prospects for more in the future.

California already has the highest gasoline prices of any of the western states, as shown in Exhibit ES-2. It is also worth noting that California already imposes more taxes per gallon than any of the states listed and that the inclusion of transportation fuels under cap and trade will add to this burden.

Exhibit ES-2—Fuel Prices by State, July 2014



SOURCE: ProMiles.com, Daily Fuel Prices, http://www.truckmiles.com/FuelPrices.asp, accessed July 2014.

These cost increases will happen simultaneous with increased uncertainty on global energy markets and exchanges.

Some of the key findings here include:

- ***Implementation of AB 32's cap-and-trade model drove a fifteen percent increase in state electricity costs in the first six months of its implementation. Over time, this is expected to increase as generators and heavy electric users must turn to increasingly expensive solutions to live within the declining emissions allowed under AB 32.***

- ***The initial costs of implementing AB 32 will be exacerbated by both rising natural gas costs (both due to market changes and increased AB 32 costs), and competing demand, for example during the winter when heating needs are highest in colder parts of the country. The state's drive for electrification of transportation (cars and transit) and an increasingly technology-oriented society are expected to increase demand for electricity at the same time the costs rise.***

- ***One provision of AB 32's implementation targeting reduced leakage from natural gas transport and distribution lines is likely to increase costs there even more. This will in turn be passed on to industrial users and electricity generators dependent on natural gas.***

- ***California's Renewable Portfolio Standard will likely exacerbate these cost increases further as energy providers turn to more expensive, less cost-efficient forms of electricity generation to meet the 2020 deadline. If***

the requirements are strengthened under this standard (through legislation for example), it will increase costs even further.

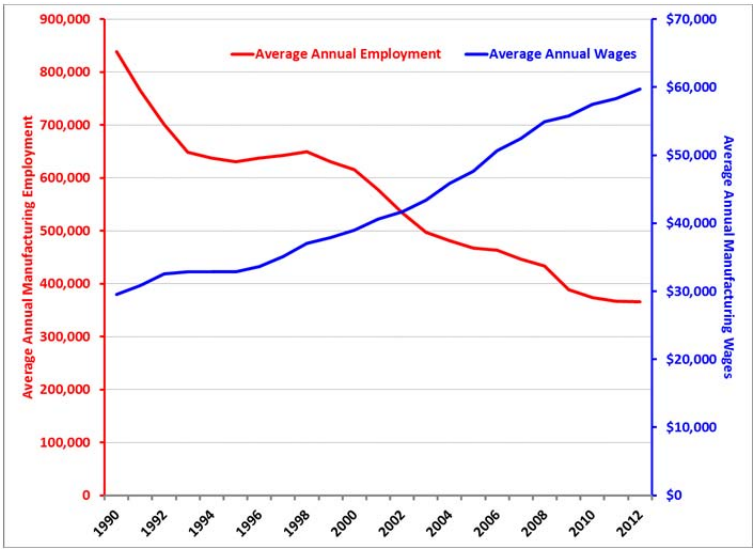
- ***Transportation fuel costs will likely be passed on to the end users and not absorbed by producers and distributors.***

- ***All of these energy increases will impose additional costs on households at the same time that inflation and other living costs rise and, as will be discussed below, at a time when the number of mobility-creating jobs is decreasing. Households living on the margin of the middle class will be the most significantly affected as they earn just enough to not be insulated by various safety net programs.***

KEY FINDINGS ON HOW RISING ENERGY COSTS AFFECT MANUFACTURING WITHIN LOS ANGELES COUNTY

Manufacturing has long been one of the central engines of economic mobility nationally as low-skilled workers could find career-length opportunities within large and medium-sized firms that promote relatively high wages and job security. Across California and within Los Angeles County, manufacturing employment has been declining for decades, as shown in Exhibit ES-3. And yet, despite these declines, the Los Angeles MSA still has the largest single concentration of manufacturing employment in the United States, totaling some 360,000 jobs.

Exhibit ES-3—Manufacturing Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

Not only is the sector under tremendous competitive pressure from Asia, Mexico and other less expensive parts of the U.S., it is also facing an increasingly difficult

regulatory environment in California as the state and localities unfold new regulations and costs. These jobs are one of the proven sectors of the economy that provide mobility and income to aspiring middle class Angelenos. Unfortunately, these jobs are also heavily impacted by the rising price of energy. Key findings include:

- ***Many manufacturing operations are energy-dependent (both electricity and natural gas) and increasingly so as they invest in more technology-dependent capital to maximize their return on wage expenditures.***

- ***The additional pressure of energy costs will lead to more manufacturing job losses in Los Angeles County, coming at a time when the labor market for manufacturing is most vulnerable. The Great Recession had a profound impact on this sector.***

- ***Once lost, these jobs will not return. This loss will undermine an important part of Los Angeles County's opportunity engine. Even with the national trend toward onshoring—bringing previously exported jobs back to the U.S.—the rising cost of energy will make the region less competitive for precisely the kinds of lower-entry skill jobs that create opportunity and mobility for poorer Angelenos.***

- ***The populations most likely to be affected are workers struggling to transition into the middle class. Because of the demographics of the Los Angeles County workforce and the location of manufacturing jobs within the region, these workers are most likely to be poor and minority—predominantly Latino and African-American.***

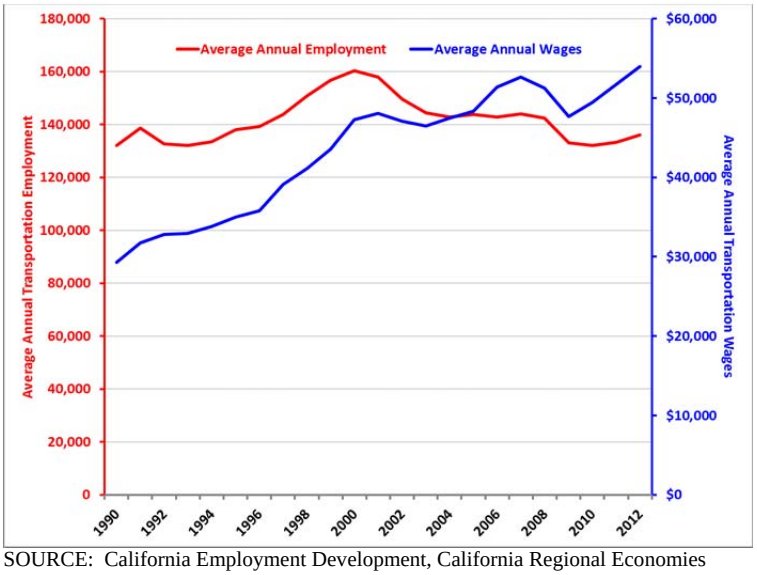
- ***Any offsetting gains in California for these job losses associated with new green technology initiatives will likely not unfold within Los Angeles County, but rather in peripheral and more rural areas and out of state. Because of the entry-level nature of these "opportunity jobs," it does not make sense to add them in high-cost urban areas like Los Angeles County—or even in California. The same factors that drive the older manufacturing jobs out of the county will represent significant barriers to opening new operations.***

KEY FINDINGS ON HOW RISING ENERGY COSTS AFFECT WHOLESALE, TRANSPORTATION AND WAREHOUSING WITHIN LOS ANGELES COUNTY

Transportation and warehousing are another key opportunity sector within Los Angeles County. The Ports of Los Angeles and Long Beach are the anchors in a transportation and distribution infrastructure that provides nearly 140,000 middle class-level jobs in Los Angeles County, as shown in Exhibit ES-4. These jobs are driven by the nearly insatiable demand in the U.S. for foreign imports—in some

ways it offsets some of the manufacturing jobs lost above as moving production offshore necessitates bringing manufactured products back onshore.

Exhibit ES-4—Transportation Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

These jobs have relatively low entry-level education and skill requirements, but thus serve as key opportunities for upward social mobility for aspiring workers. For this reason, it has been an area of deliberate focus and emphasis in Los Angeles County. It is also under some significant pressure as it recovers from the Great Recession.

Key findings with respect to trade, transportation and warehousing include:

- ***This employment sector in Los Angeles County is under tremendous pressure from domestic competition. U.S. ports like Seattle and Portland have been aggressive in targeting Asian trade routes. Current efforts to widen the Panama Canal and even the prospect of constructing a new canal across Nicaragua will open up competition for Pacific trade to ports in the Gulf of Mexico and perhaps even the East Coast as ships can bypass the West Coast and get the goods closer to their final destinations.***

- ***International Pacific Rim ports such as Vancouver, British Columbia and Ensenada, Mexico represent increased competition as cross-border trucking regulations have made it easier to transport goods into the United States.***

- ***Transportation fuel costs have a major impact on this sector. Efforts to drive up prices of transportation fuels to reduce greenhouse gas emissions will directly increase the operating costs of the ports as well as the trucking and rail companies that provide the infrastructure for this sector.***

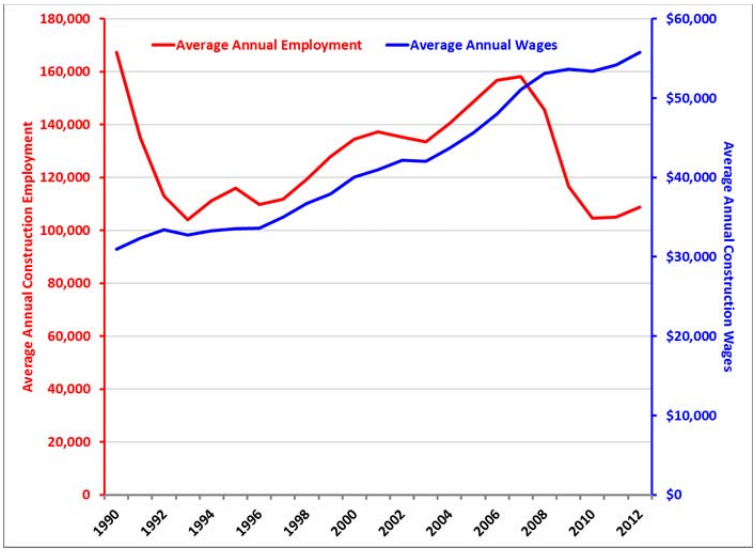
As costs rise, much as has been the history in manufacturing, alternative and competing ports will become more attractive and more of these opportunity-generating jobs will be lost to the county.

- ***Rising electricity and natural gas prices will have an increasing impact on jobs in this sector in the long run as state efforts to convert transportation (including trucking and rail) to electric and natural gas systems with lower emissions take hold.***

KEY FINDINGS ON HOW RISING ENERGY COSTS AFFECT CONSTRUCTION WITHIN LOS ANGELES COUNTY

Construction is the third key opportunity-generating sector within Los Angeles County. While much of its performance is directly driven by the overall economy and real estate market, as can be seen by the huge shifts in the 1992-1994 and 2008-2010 recessions in Exhibit ES-5, it has been and continues to be a key sector of opportunity for workers climbing into the middle class. The well-organized trades combined with a very liquid labor supply have allowed this sector to continue as an opportunity magnet, even in these difficult times. As the sector recovers from the Great Recession, it continues to reflect a special set of opportunities for low-skill, entry-level workers.

Exhibit ES-5—Construction Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

Construction as an opportunity sector is different than manufacturing and trade and transportation in that it is more geographically focused than the other two trade-oriented sectors. Construction jobs are more oriented toward meeting local needs and the sector is thus more deeply integrated into the local economy. It serves not

only as a foundation for employment but also a key sector for building key infrastructure in the local economy—the homes in which workers live and the buildings in which they work. Even so, construction is also affected by rising energy costs in key ways:

- ***Many key construction materials are very energy-intensive. Cement manufacturing, for example, requires more energy than almost any other form of manufacturing. Rising energy costs will not only affect these producers, but also affect the attractiveness of development in the region overall as materials costs are one of the main considerations in real estate development.***

- ***Construction has a high transportation cost component as equipment and materials must be transported to and from the construction sites and waste materials removed. The increasing price of transportation fuels will drive development costs higher and thus make it more difficult economically resulting in reduced employment.***

- ***Further exacerbating the materials and transportation costs of development are the new generations of green building codes and provisions that are being imposed on new construction under the provisions of AB 32—everything from requiring compact fluorescent or LED light bulbs to the creation of "zero net energy" buildings. There are also mandates for development and sprawl reduction included. These all affect the attractiveness of development within the region and drive costs higher.***

- ***Jobs lost in construction are not replaced by new opportunities in other sectors. In fact many of the manufacturing sectors affected by suppressed development are key categories in the local manufacturing sector above, so lost construction jobs have a direct multiplier effect within the opportunity economy.***

OPTIONS TO PRESERVE OPPORTUNITY IN LOS ANGELES COUNTY

The key to deciding what should be done in response to the challenges that the state's energy policies raise for the opportunity economy in Los Angeles County is to understand that it is about balance and tradeoffs. The state's remarkable and broad commitment to environmental preservation is a bold one, but not one that should be pursued **at all costs**. The state and the county must balance the tangible, real, and immediate costs it will experience over the next decade against the diffuse and long-term benefits or at least find ways to mitigate that impact.

There are four dimensions of the AB 32 implementation process that need to be better addressed as the state moves ahead: (1) the timing of the process; (2) the

targeting of the process; (3) involving the affected constituencies more directly in the design of the process; and (4) developing tripwires and waypoints for responding to economic and environmental changes as needed.

TIMING

The Legislature and the California Air Resources Board have been very aggressive in establishing goals, dates and times to ensure that the state reaches its 1990 emissions levels by 2020—five and one-half short years from today. This aggressive timeline affects the opportunity economy in two important ways:

1. **AB 32 sets a target date for 2020, but it is only a goal and the arriving at that goal in 2021 or 2025 are not automatic or cataclysmic. But the jobs that may be lost under an overly-aggressive implementation of AB 32 are likely gone for good on the day they leave the county. The state must be willing to adjust and delay some of the specific points of implementation if the costs to the economy and the public welfare are too great.**

2. **The economy is current struggling to recover from the Great Recession. This year is the first time since 2007 that the economy is showing signs of recovering from the collapse of the real estate bubble. The imposition of significantly higher energy costs under the implementation of AB 32 has the very real potential to derail that recovery overall and to force California, and especially Los Angeles County, to lag further behind the rest of the country in its recovery at precisely the time when it needs to be allowed to gain momentum. If this produces a stall in the recovery, it could spread the effects of these higher energy prices far beyond the opportunity sectors discussed here to bring greater damage the recovery of the entire economy. The state must take these economic effects into account as it sets deadlines and be willing, for the public good, to modify them to protect the state's opportunity economy.**

TARGETING – SAVING JOBS IN KEY OPPORTUNITY SECTORS

Based on this review of Los Angeles County and its opportunity sectors, the implementation of AB 32 will cause job losses in several key sectors in the County. In fact, the sectors ***most*** likely to be adversely impacted are the very sectors and places in the economy where the region's poor and less-educated workers have the best opportunity to work their way into the middle class. These workers, largely from minority communities are the ones likely to pay the cost of reaching the long-term goals listed under AB 32. Given these concerns, the state should:

1. **Ensure that the energy cost impacts on these key sectors are minimized. Unlike workers in many service jobs, workers in the opportunity sectors have the least employment mobility. Concrete pourers do not magically**

become high-tech solar company technicians or electric vehicle battery manufacturers when their current job goes away. Their best prospects at upward income mobility is for the jobs they already have to remain here. Consequently, the state should create subsidies, credits, offsets and exemptions for businesses in these three opportunity sectors to minimize the destruction of these important opportunity jobs.

2. **One argument built into the assumptions that made AB 32 pencil out in the theoretical models used by the state to estimate its net economic effects was the creation of a whole new cadre of green-tech jobs within the state that would more than offset (according to the model) the jobs lost to rising energy costs. This author remains skeptical of these assumptions—especially the assumption that they would remain largely in California at a time when nearly every other manufacturing sector is seeking lower cost, higher quality-of-life locations elsewhere. To the limited extent these jobs do materialize within California, determined effort must be made to ensure a significant share of them are channeled into the places where AB 32 caused the greatest job losses—places like Los Angeles County. State policy makers must create appropriate incentives to ensure that, to the extent possible, these new companies are located in the places that have lost their manufacturing, transportation and construction jobs.**

INVOLVING BUSINESS AND COMMUNITY CONSTITUENCIES

Jobs are not just about private sector businesses and corporations. The people who hold the jobs prospectively affected by the state's energy policies are also voters and residents in the affected communities. They live, work, pay taxes and service their communities, creating economic and social capital. Much of the state's new regulatory framework has strongly favored the interests of environmental groups and narrow sets of single-interest actors. As AB 32's implementation continues, the state needs to broaden the participation of more stakeholders and include more of their concerns within the implementation process. Suggestions include:

1. **Developing advisory groups on the status of opportunity jobs in the states various regions, and especially Los Angeles County. The real-life impacts of the state's rising energy prices and energy regulation have significant impacts on many of the state's hardest-working residents. These groups could discuss the effects that rising energy costs are having on their communities and workplaces and provide advisory input to the regulatory processes.**

2. **The state's business communities—and especially those industry sectors most affected by rising energy prices and the cap-and-trade regulations—should be major participants in ascertaining which steps in the implementation process are realistic and worthwhile, and which are likely**

to impose unrealistic expectations that will necessarily cause businesses to fail or leave the state. Business groups within each of the state's affected industry sectors should be involved with the writing of realistic provisions specific to each industry that will accomplish the broader goals while minimizing the impact on employment.

3. **The state should work with the energy producers to find ways of reducing overall energy costs to minimize the net impacts of AB 32 implementation. Many strategies, including more extensive development of California's local energy sources (to minimize transmission losses) and construction of new tie-ins to lower cost energy sources could result in savings comparable to those currently proposed at a lower overall economic cost.**

4. **The current model calls almost exclusively for strategies that completely eliminate the use of the fuels most commonly used today. It may be more economically realistic to transition to lower emission technologies short of zero-emission technologies. For example, converting a car to CNG is far cheaper than buying a new electric vehicle. This could advance the state's efforts to dramatically reduce its carbon footprint at much more reasonable cost while preserving opportunity. Alternatives such as CNG vehicles should be included in the state's short-run vision with a hope for better, more feasible (and cost-effective) zero-emission technologies in the future.**

RESPONDING TO CHANGING VARIABLES

Finally, the state needs to be responsive to the rapid changes in the economic and social context of the provisions of AB 32. Many of its provisions interact with other priorities and policies within the state. For example, the dual goals of mandating more electric vehicles at the same time that its policies drive up electricity prices forces households to purchase new, expensive vehicles at the exact time that the energy for that vehicle spikes in price. Households, and especially middle class households, are then hit with a double increase—the need to buy more electricity and at a higher price. At the same time, that household's electric, natural gas (for heating and cooking) and water bills are rising. Throw in a rising housing market where rents are climbing and the net impact of AB 32 just may price them out of their house and home. The state must find ways to recognize these effects and to respond to them quickly, not just once every two-to-three years.

- **One approach to ensuring a responsive state regulatory process is to create real-time indicators of economic variables. The California Air Resources Board should provide, as part of the AB 32, a real-time "dashboard" of verifiable economic indicators. This dashboard should report the tons of GHG reduced, the costs of electricity, natural gas,**

and fuel for each region (perhaps even zip code in the state), the changes over time, the changes in employment in those communities, and clear notifications of impending policy changes and the effects they are likely to have. This would allow local residents to understand the impact that the policies have had on them.

- **Another approach is to develop detailed economic reporting matrices of activities within the industries most affected by the state's energy policies. These reporting sites would be developed in collaboration with the specific industries to examine the ways in which the new energy regulations are affecting their specific sectors and the costs associated with them.**

- **In the event of significant spikes in the cost of energy, such as those seen in 2009-2010, the state should be ready and willing to set aside its long-term energy goals in the interest of protecting California opportunity and jobs.**

At the end of the decade, the truest measure of the state's success will be in how well California made the tradeoffs in leveraging and protecting its endowments of precious environmental and economic resources.

AB 32 represents a great opportunity, but with that comes a risk that, unless it exercises prudence, it will come at the cost of its opportunity economy—those jobs that continue to be an engine to create a middle class life for some of the state's most at-risk populations—including many of its poor and minority communities. Even as the county more desperately needs these opportunity sectors to flourish to maximize the mechanisms for income mobility for Angelenos currently in poverty, the new costs imposed by AB 32 are aimed directly at these businesses. Los Angeles County's opportunity economy is fragile and policy makers must be careful not to permanently disable or destroy it while pursuing its energy goals.

TABLE OF CONTENTS

TABLE OF EXHIBITS

CHAPTER ONE—THE CONTEXT OF ENERGY POLICY IN LOS ANGELES COUNTY

Los Angeles County is the heart and soul of the modern California dream and the American experience. While the state's older and more worldly northern sibling is now home to the glitz and glamour of the modern, pricey technology and internet sectors, it was the golden sands, sprawling suburbs, shining camera lights that drew dreamers to Los Angeles and created its powerful Middle Class engine. Birthed in the fame of Hollywood and hardened in the determined crucible of three consecutive Pacific Wars, Los Angeles has become the place where the unimaginable is not only conceived but done—the special effects of Hollywood, the missiles; the bombers and fighters that propelled a half-century of unrivalled American military and political power; sparkling canals that transformed deserts to farmlands and surging major cities that move people and goods at in unimaginable volumes.

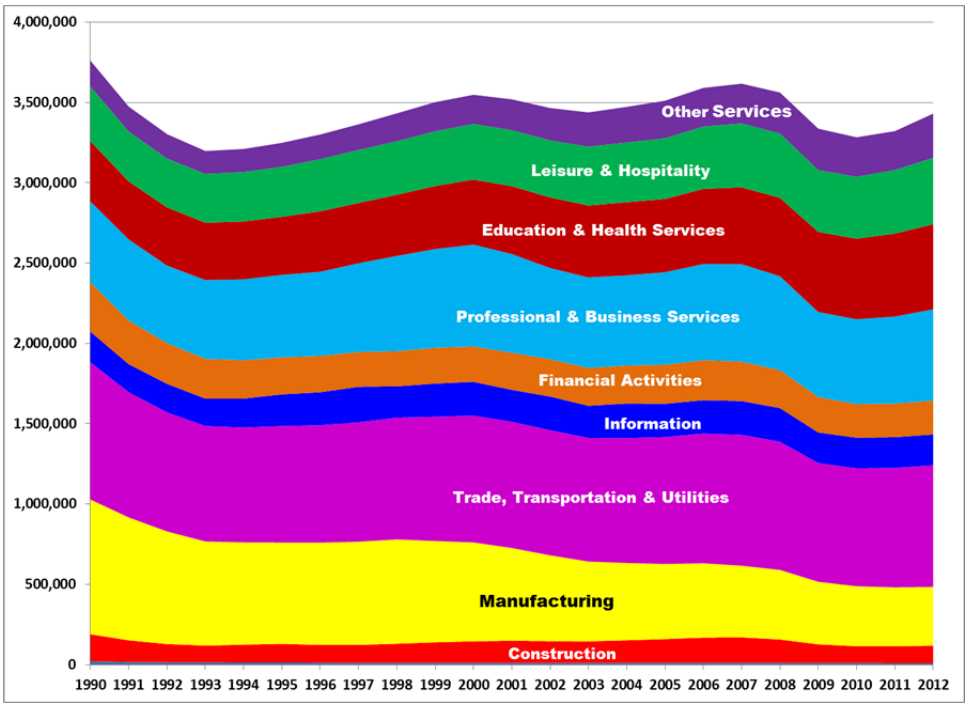
The frontier, can-do spirit that birthed the west has spawned decades of success with names of storied characters like Mulholland, Disney, and Mayer, as well as corporate names like Lockheed, McDonnell-Douglass, Raytheon, Bechtel, and Northrop Grumman, dotting its skyline. Anchored by its world-class universities, including cross-town rivals USC and UCLA, Los Angeles grew into one of the world's leading places for innovation—giving us cartoons, amusement parks, the B-2 bomber, and an optimism that was contagious across the nation. It was this infectious Californian belief that anything was possible if you could just imagine it, that President Reagan used to transform America and to recapture its direction and momentum after the setback of Vietnam and the embarrassment of Iran.

Nothing epitomized or defined California more than the suburban house with two cats in the yard, manicured lawns and neatly painted shutters. It was here that the middle class came to work hard to climb the ladder of success while their children attended its new schools and growing universities. Jobs and opportunities came in all walks and in all sectors of life—population growth combined with a powerful and highly productive economy that had to import and employ migrants from other states and, later, immigrants from other countries to keep up with itself. Los Angeles seemed almost immune to the plagues that struck other economies—recessions were not as severe, jobs usually were plentiful, the weather was almost always beautiful and sunny—reflecting the general attitude of its residents. Even as test scores started to succumb to over-enrollment and surging, non-English speaking populations, the state could always attract more skilled workers from abroad. Inflation—especially in the form of housing prices—was an issue but rising salaries, promotions and two-income households became the answer.

The early 1990s were, in some ways, the first taste of reality for California and especially Los Angeles. The demise of the Soviet Union created a peace dividend that had to be paid—and it turned out that Los Angeles was the place to pay the steepest price. Disadvantaged by a rookie U.S. Senate delegation, Los Angeles County paid a dear price for peace, losing more than 250,000 aerospace and defense-related jobs in the span of just a few years in the early 1990s—a cut which led to the loss of more than 400,000 jobs overall. In fact, Los Angeles and California led the rest of the nation into recession—although its effects were far deeper and more pronounced in Los Angeles. During this period, thousands of middle class Californians suddenly began looking outside the Golden State for their next opportunities and the decline in manufacturing, which began with the demise of U.S. electronics, steel and auto production in the 1970s, became a frenzy. You can see this decline quite clearly in the shrinking yellow band of manufacturing jobs in Exhibit 1.

But Los Angeles is a large, robust and dynamic economy and it recovered quickly. Riding in part on the coattails of the dot.com bubble, information and technology grew quickly and especially as they related to Los Angeles' well-entrenched entertainment and aerospace industries. Simultaneously, there was a surge in trade as the U.S. and California economies took off. Finance and real estate employment surged, as well as professional and business services, bringing new life to the Los Angeles real estate market. Even when the dot.com bubble burst, the road back was a bit easier for Los Angeles as these sectors were the beneficiaries of the real estate bubble that became the foundation of the Great Recession. Health care services and education also blossomed as the region's population grew and aged, and the housing and transportation nightmares associated with growth again became the norm.

Exhibit 1—Los Angeles Employment, by Industry, 1990-2012



SOURCE: California Employment Development Department California Regional Economies Employment Series.

That momentum carried through until 2008 when Los Angeles joined the rest of the country in the Great Recession. Real estate was, up until that time, one of the challenges for the Los Angeles economy—we had a surplus of jobs but it was next to impossible to find a decent place for the workers to live. Many sectors, like business services, finance and construction, fed off of this rise in home values. Others, especially in the lower end of the pay spectrum languished, waiting for workers who could afford to live in LA on their meager scales. In response, financiers invented new ways to make real estate deals happen and inadvertently set the stage for the Great Recession.

In the devalued real estate market that followed, the Los Angeles economy was hit hard like most high-growth areas in the country and since has slowly seen only a few signs of recovery. Los Angeles County, like much of California outside Silicon Valley and the San Francisco Peninsula has struggled—faring better than some regions and worse than others. The past two years have seen some signs of recovery, but nowhere near the numbers seen in the recoveries from recessions past. It is in this tenuous context that this study is cast. The numbers show Los Angeles County to be an economy on the mend, but also an economy seeking what will likely have to be a new path forward—parts of it are fundamentally restructured or gone.

That path is complicated by several global, national and state-level policy issues that may redraw the map that the county must follow. This paper will examine the effects of one set of those policies—namely the decision by Californians to

unilaterally roll back their carbon emissions to the levels they produced more than 20 years ago. The course of action Californians have chosen has significant implications to Los Angeles County and its economy.

CALIFORNIANS AND THE ENVIRONMENT

Californians, and especially Los Angeles County, are known for their deep awareness of the outdoors and appreciation for the beauty of their natural environment. While California has historically been one of the places most known for economic opportunity in America, it is equally well-known for its sun-swept beaches, gorgeous snow-capped peaks, barren desert habitats, and stunning sunsets. Los Angeles sits in the middle of all this beauty and its climate and natural beauty represent one of its most marketable features. While you can educate a new labor force almost anywhere and bring infrastructure to the most remote regions of any location, you cannot change its weather and Los Angeles County is blessed with one of the greatest climates on earth. No matter what issues shape an individual's or a business's decision on where to locate, the weather in Los Angeles is unrivaled in its quality.

Living and appreciating the state's splendor is also part of the reason why Californians are so committed to protecting it. When the water and air pollution peaked in the early 1970s, California was among the first to embrace, albeit not without complaint, the new provisions of the Clean Air Act, the Clean Water Act, and even the Endangered Species Act. More so than anywhere else, Californians and Angelenos appreciate the delicate balance that must happen between preserving economic opportunity and preserving the state's natural beauty and resources.

It was this same sensitivity to natural balance that lead California to be the first state to adopt significant legislation that would address its production of greenhouse gases—so-called "carbon emissions." With the adoption of the Global Warming Solutions Act (AB 32) in 2006, the state set out to roll back the level of greenhouse gas (GHG) emissions in California to the levels it produced in 1990—a bold initiative that everyone knew would come at a great price. At what price no one knew then and, since it hasn't yet fully played out, we do not even know today. It is still in its initial stages of implementation and those costs are beginning to add up today.

With the arrival of the Great Recession in 2008 to 2009, California's economy tumbled and the matter of AB32 was placed before the voters in the statewide election in November 2010 as Proposition 23 for reconsideration. At that time, despite the state's weakened economic condition, voters across the state voted 61.6 to 38.4 percent to retain it as the law of the land. Los Angeles County, in particular, voted 2-1 to retain AB32.

THE PROCESS AND COSTS OF IMPLEMENTING AB 32

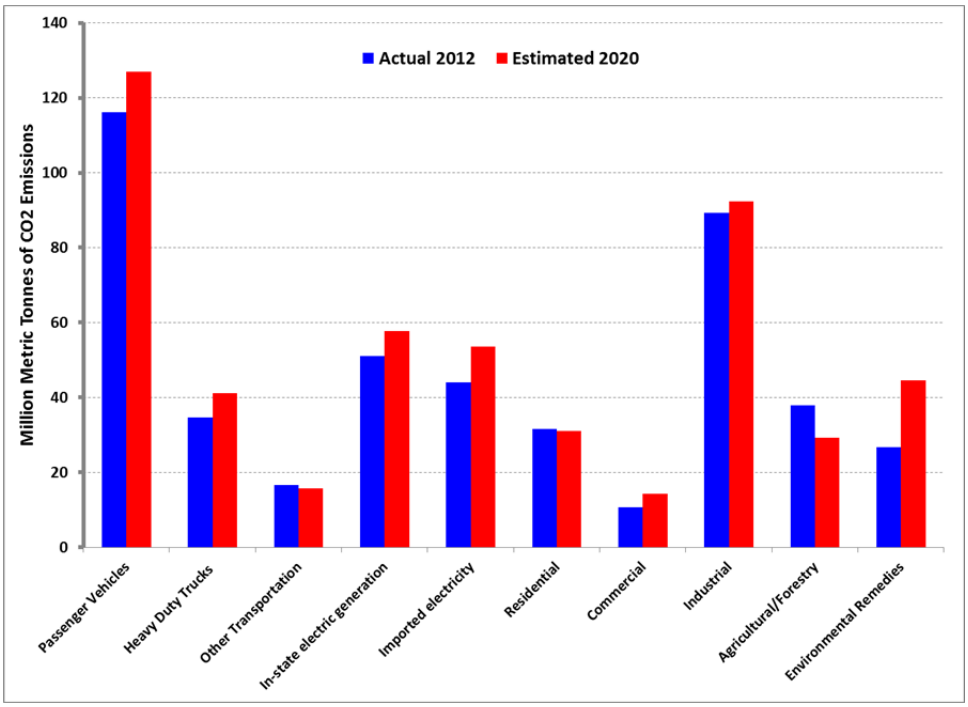
Today, in 2014, we have just begun to experience the impacts of the costs of implementing AB32 as the first markets were set into motion in 2012. AB32 requires the California Air Resources Board (CARB) to create markets for declining-value, tradable emissions permits that will allow the state to achieve 1990 emissions levels by 2020. The program currently applies to "major sources of GHG in the state such as refineries, power plants, industrial facilities, and transportation fuels."[1]

The reduction levels targeted in AB 32 are significant with an annual target level of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gas emissions by 2020. In 2012, the CARB estimated California's GHG emissions to total 459 MMTCO2E of greenhouse gases with total emissions projected to grow to 507 MMTCO2E by 2020 absent any intervention. Thus, AB 32 calls for a reduction of some 7.5 percent from 2012 emission levels and a decrease of 18.7 percent overall by 2020.[2] These goals are quite aggressive, especially in the short seven years allowed for the implementation of the AB 32 plans and programs. The largest source of these emissions is from passenger vehicles and industrial production, as shown in Exhibit 2. The latter emitters were regulated in the first stage of the regulatory scheme which launched last year in 2013, while vehicles are slated for inclusion in 2015. The rules and regulations for that second stage of the cap and trade system are just being reviewed and discussed. After passenger vehicles and industrial sources, electricity generation represents the next major source of GHG emissions and, with increasing electronic lifestyles and a legislative commitment to expanding the number of electric vehicles on the road, demand for electricity generation is expected to swell in the years ahead.

[1] Air Resources Board, "Assembly Bill 32: Global Warming Solutions Act," http://www.arb.ca.gov/cc/ab32/ab32.htm, accessed July 1, 2014.

[2] This projection was prepared in October 2010, immediately after the peak of the Great Recession. These estimates are heavily contingent on model assumptions, especially about the aggregate levels of economic activity, much as the savings are contingent on quick technological change. The estimate just two years earlier in October 2008 pegged projected 2020 emissions at 596.4 MMTCO2E—almost 20 percent higher than the 2010 forecast.

Exhibit 2—Carbon Emissions by Source, Actual 2012 and Projected 2020



SOURCE: California Air Resources Board, *Greenhouse Gas Emission Inventory: 2000-2012*; *Greenhouse Gas Inventory – 2020 Emissions Forecast.*

The implementation plans for AB 32 call for a reduction of nearly 20 percent of the GHG emissions relative to baseline projections for 2020. The market itself was just officially launched on January 1, 2013 for utilities and large industrial facilities with expansion to include distributors of transportation, natural gas and other fuels in 2015. The model calls for those who have GHG emissions to reduce their emissions by about 2 percent in 2013 and 2014 and about 3 percent per year for the five years from 2015 to 2020. Some allowances have been built into the system to offset small parts of the costs of these permits, but the reality is that **all GHG producers, including the state's utilities, natural gas, and gasoline providers will experience significantly higher costs in response to these new regulations and the costs associated with AB 32.**

The purpose of this study is to look at the impact of these changes in energy policy in California and to discuss what some of the potential impacts are to residents of Los Angeles County. It is important to note that this analysis is not about whether AB 32 is or should be the law of the land—it is and that decision was made by voters in 2010. The question here is to identify some of the prospective costs of that choice and to understand their real magnitude to California and especially Los Angeles County. It is also to initiate a conversation about ways that we might collectively act to mitigate some of those costs if they are deemed too high, and to find a better balance between protecting the state's rich natural heritage and its powerful legacy as a land of economic opportunity.

In the next chapter, this analysis will examine the ways that the Los Angeles County economy works to provide opportunity, and especially for those seeking to enter the middle class. Chapter Three will then turn to the impact that the state's emerging energy policy will have on that workforce and examine that policy's impact on the range of economic opportunities in the region, especially how the costs associated with the implementation of the state's new cap-and-trade system for GHG reduction will affect key sectors of the County's opportunity economy. Finally, Chapter Four will share some policy suggestions and alternatives as a way to initiate a dialogue on what must be done to preserve Los Angeles County's unique opportunity economy.

CHAPTER TWO—UNDERSTANDING LOS ANGELES COUNTY AS AN ENGINE OF OPPORTUNITY

In 2007, this author collaborated with New Geographer Joel Kotkin on a project in Houston, Texas looking at the unique blend of attributes that fueled the city's ascendancy to one of the major metropolitan growth centers in the United States.[3] We coined the name "Opportunity Urbanism" to represent the combination of freedom, opportunity, and action that lead to that city's success then — success that has continued over the past seven years—and has led to its emergence as a world city—joining the ranks of London, New York and Los Angeles.

Los Angeles was seen as a model of the key attributes that create these nodes of opportunity. The key attribute is that these elite cities were places of opportunity for all parts of the income spectrum, not just the elite or creative classes. Mayors of places like Atlanta, Portland, and San Francisco revel in the opportunities created for the elite scientists, lawyers, and high-cost entrepreneurs. Opportunity urbanist cities are those that provide opportunity for people of all income groups and, in the course of providing that opportunity, provide a ladder of opportunities whereby they can move up to a better quality of life. These metros are also often at crossroads of travel and trade and provide jobs across a broad spectrum of skills, education levels, and work styles.

Los Angeles County has been a prototype for this model for more than 80 years. Whether it was the young star or starlet leaving the Midwest looking for their big break in Hollywood, or the Dust Bowl farmer seeking for a new start, southern California and especially Los Angeles were more often than not their first stop. World War II saw an acceleration in this role with the creation of a war stores manufacturing center that fed the regional economy for decades. It also fed the development of a middle class ethic and culture envied across the nation and around the world.

That model also created a cycle of income mobility and opportunity. A former colleague, Dr. Michael Dardia quantified this phenomenon in 2002 in one of the few studies that followed individual California workers over time to see what happened to their incomes.[4] He found that 80 percent of those in the lowest income quintile

[3] See Joel Kotkin, *Opportunity Urbanism: An Emerging Paradigm for the 21st Century*, 2007, published by the Greater Houston Partnership, 81 pp.

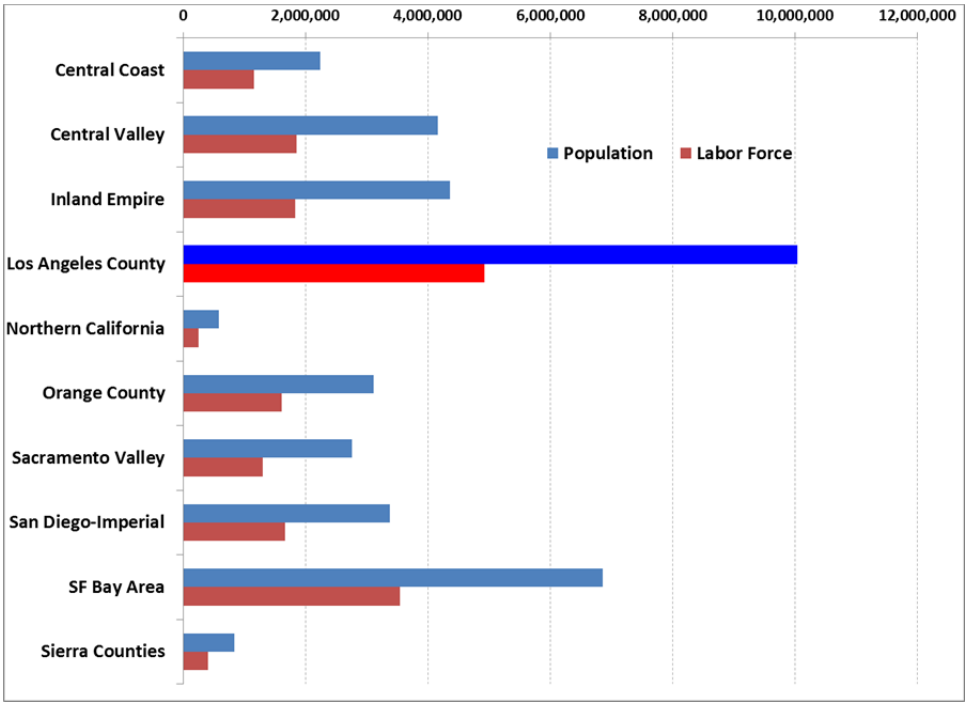
[4] Michael Dardia, et. al., "Growth and Employment: Moving Up? Earnings Mobility in California," *California Policy Review*, Volume 1, Number 4, April 2002, published by

in 1988 had moved up and out of that quintile by 2000, and more than half of those in the second and third quintiles did likewise. In other words, California wasn't a story of the rich getting richer and the poor getting poorer, but rather a story of the middle class getting richer and the lower income groups doing even better. *Everyone* was doing better after 12 years. This remarkable finding is the secret to LA's opportunity economy.

UNDERSTANDING LOS ANGELES COUNTY'S UNIQUE WORKFORCE

While the glint of Los Angeles County as a Mecca for this kind of success has dulled a bit in the past decade, it remains the heart of the California economic engine. As Exhibit 3 shows, more than one in four Californians are Angelenos, accounting for almost 27 percent of the state's workforce. In fact, Los Angeles County's workforce is nearly 40 percent larger than that of the next largest region, San Francisco Bay area to the north.

Exhibit 3—California Population and Labor Force, By Region, January 2014



SOURCE: Population-California Department of Finance Demographic Research Unit; Labor Force-California Employment Development Department

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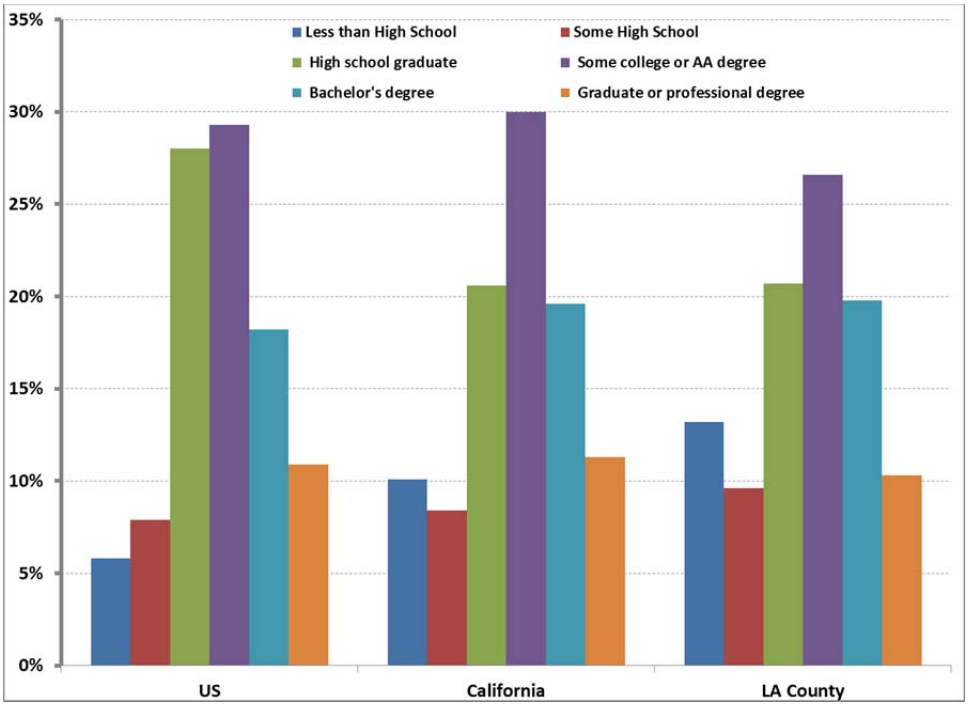
Sphere Insitute, http://www.sphereinstitute.org/publications/CPR_v1n4.pdf, accessed July 2014.

It is also an extremely diverse population—not just ethnically, but also by education, age, and income—reflecting the diversity of experiences and origins that come from being located at a crossroads between many places and nations.

As a large economy, Los Angeles County draws from a wide range of skills and experience to staff its industry and commerce. Los Angeles County has a much wider range of educational attainment within its roughly 10 million residents than much of the rest of the country as shown in Exhibit 4. While LA County's share of college-educated workers is comparable to the state and national shares, it has a much higher share of residents with less than a ninth grade education—more than twice the national average (13.2 percent vs. 5.8 percent). These are especially the workers who can benefit from an opportunity economy like Los Angeles County's as we will see below.

Exhibit 4—Educational Attainment, By Place, 2012



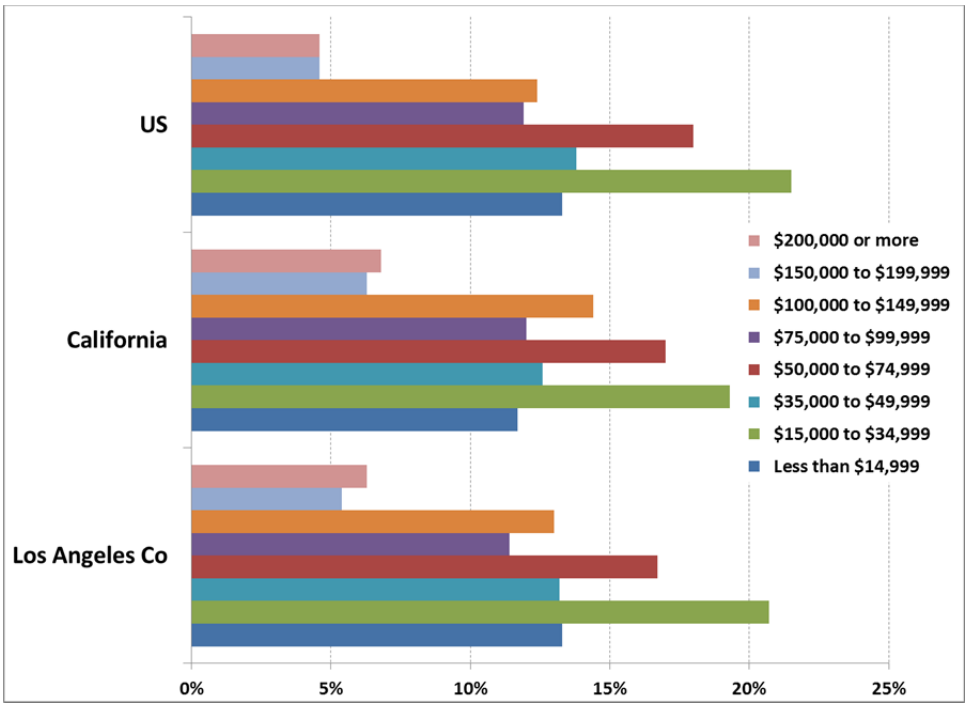
SOURCE: American Community Survey.

Los Angeles also has a workforce with a wide age base –home to many new, younger workers who can fuel economic growth. These workers will provide the new skills that will fuel the state's and nation's future innovation and growth.

As a result, Los Angeles is successful at supporting opportunity for a wide range of incomes. As Exhibit 5 shows, Los Angeles County has more density (and thus more people) toward the bottom—on the lower income side—of each distribution. This also means that upper income households represent a slightly smaller share of households than can be seen at the state and national levels. This tendency closer to the bottom of the income spectrum also shows in Los Angeles County's median

household income which, at $53,001 is significantly lower than the California median at $58,328. Both, however, lie above the national median household income of $51,371, reflecting in part the wage premium necessary to cover the higher-than-average housing costs and other costs of living in southern California.

Exhibit 5—Income Distribution, by Location, 2012

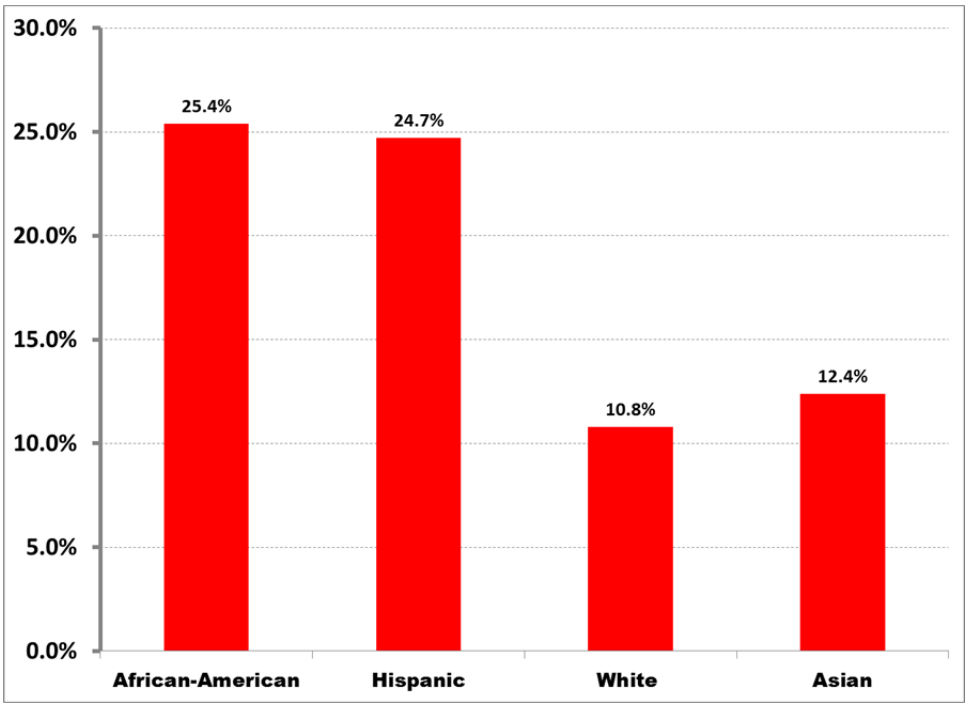


SOURCE: American Community Survey.

As a major destination for immigrants and lower-skilled workers, Los Angeles has a relatively high poverty rate, totaling some 19.1 percent of households overall. Much of this poverty is concentrated in minority households as shown in . This concentration of poverty makes it all the more essential to ensure that the opportunity engine which has served Los Angeles so well in the past can be preserved and even primed into the future.

Exhibit 6. These minority households are the same ones populating the lower side of the earnings distribution shown in Exhibit 5. This concentration of poverty makes it all the more essential to ensure that the opportunity engine which has served Los Angeles so well in the past can be preserved and even primed into the future.

Exhibit 6—Poverty Rates in Los Angeles County, by Race/Ethnicity, 2012



SOURCE: American Community Survey.

For this relatively numerous population, Los Angeles' ability to provide opportunity and income mobility are particularly important. One of the challenges cited in the national policy debate is the decline or disappearance of the middle class—the destination of choice for these poorer Americans. While Los Angeles County mirrors this trend, it also retains significant vestiges of the middle class—in part because of its success in the distant and recent past of moving individuals from lower income groups into this critical core.

It is critical for Los Angeles, to sustain the dynamism and drive of its economy, to find ways to preserve the income ladder and opportunity essential to move into the middle class. To understand where these opportunities exist, it is important to understand (1) what constitutes the middle class; and (2) the types of jobs and opportunities that provide middle class incomes to those who live in Los Angeles.

For purposes of this discussion, middle class jobs are defined as those where the annual income starts at approximately $40,000. At this income level, if a second lower-wage earner is added, the two-income household reaches a level where it would be possible to own a home in certain neighborhoods and where the state's income assistance models no longer provide incentives and support.

For workers in this cohort, it is also important that the jobs available to them do not have steep education entry requirements and sophisticated learning curves. While education is certainly one of the keys to American and Angeleno income mobility, and a growing number of Angelenos and Americans are attending college, part of

the success of Los Angeles has been creating this mobility through the workforce. There is a select group of occupations which provide middle-class incomes while having fairly limited educational "entry" requirements for employment. So where do these jobs fall in the Los Angeles County economy? Exhibit 7, which shows employment by industry in Los Angeles County, also identifies some of those sectors which have relatively low educational requirements for entry level positions which are highlighted in both orange and yellow. Those with average wages less than the $40,000 are highlighted in orange, while those representing the labor market's prime opportunity sectors are highlighted in yellow.

Exhibit 7—Los Angeles County Employment, by Industry and Average Wages, Selected Years

Industry	Average Employment 1990	Average Employment 2000	Average Employment 2010	Average Employment 2012	Average Annual Wages 2012
Agriculture, Forestry, Fishing & Hunting	13,878	7,818	6,307	5,573	$31,304
Mining	8,409	3,432	4,204	4,312	$164,115[5]
Construction	167,254	134,446	104,647	108,706	$55,764
Manufacturing	838,951	615,501	373,487	365,526	$59,729
Wholesale Trade	251,060	222,933	203,115	211,286	$58,540
Retail Trade	453,747	393,731	386,524	397,385	$32,084
Transportation	134,652	161,050	132,319	136,174	$52,428
Utilities	17,558	12,450	11,732	12,521	$100,422
Information	190,304	210,014	190,854	192,031	$101,056
Finance and Insurance	220,237	146,201	138,067	138,448	$102,679
Real Estate and Rental Leasing	87,252	74,397	71,676	72,195	$58,394
Professional, Scientific, & Technical Services	267,117	261,480	246,642	267,471	$90,183
Management of Companies & Enterprises	15,097	97,370	52,370	56,299	$99,073
Administrative & Support &Waste Management	221,134	274,435	228,676	244,302	$36,981
Educational Services	72,255	75,518	92,052	101,765	$50,174
Health Care & Social Assistance	302,493	329,747	409,517	428,211	$51,782
Arts, Entertainment, & Recreation	73,051	62,530	68,582	71,085	$104,378
Accommodation & Food Services	267,047	283,140	316,730	342,602	$20,162
Other Services	161,283	181,998	256,034	289,407	$21,708
Government	539,800	581,300	579,600	556,800	n.a.
TOTAL	**4,302,579**	**4,129,491**	**3,873,135**	**4,002,099**	

SOURCE: California Employment Development Department California Regional Economies Employment Series.

[5] The average salaries for the Mining Industry are skewed by small sample size and some outlier salaries in oil and gas extraction.

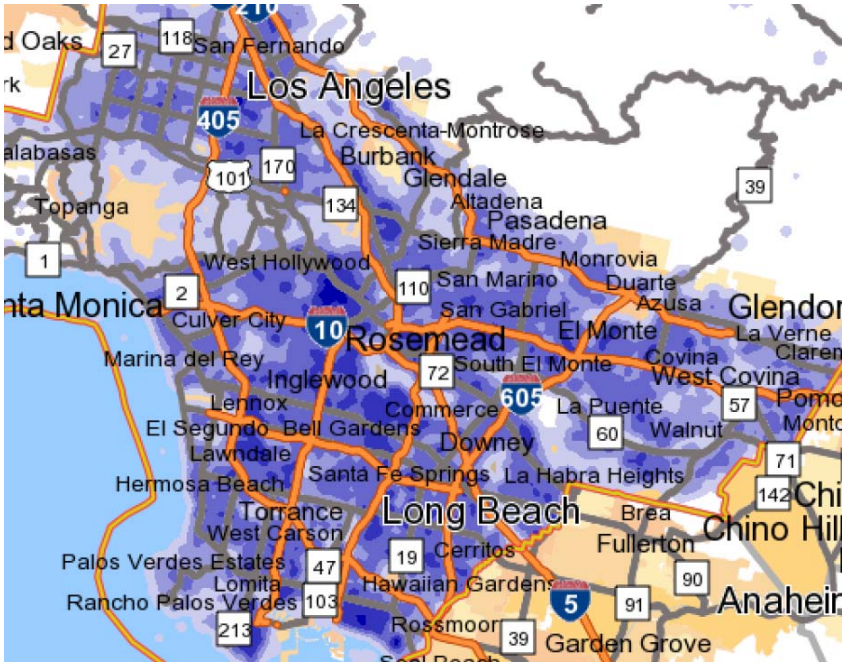
Within these data, two sets of middle-class jobs seem to emerge: (1) transitional jobs where individuals with relatively few prior skills and limited-to-modest education can enter into employment and earn a middle class wage; and (2) sectors where specific and higher levels of skills and education are required and workers accumulate human capital and move into the upper middle and lower upper income cohorts. Into the first group fall jobs in manufacturing, wholesale trade, and construction. These are jobs were new and inexperienced workers can climb onto the first rung of the income mobility ladder. The second group represents the jobs, often reserved to the next generation of workers, where more extensive training and education are necessary—sectors like professional and business services, financial activities, education, and government services.

Perhaps most striking are the white areas of the table, which represent the upper middle class and higher skill parts of the industry sectors and are concentrated in business services, education and real estate. In days gone by, the top end of the middle class would be much more clustered around manufacturing rather than these service sectors seen here today. Also note that Health Care & Social Assistance shows a modest, very middle-class average salary of $51,782 and yet is highlighted in orange, denoting that its wages do not allow it to fit the definition of an opportunity sector. This is because this number represents the average of two groups of workers—very high-skill workers with high entry-level education requirements who command a high average wage, and another group of workers who have a very low average wage who are comparatively unskilled.

Another way to look at Los Angeles County's workforce is to look at it spatially. Exhibit 8 shows the place of residence for workers who earn just below the $40,000 middle class income threshold in their primary jobs (darker blue represents higher concentrations). What stands out in this map is that, even though there are clearly significant concentrations of areas where housing is more affordable, they still blanket the entire map. The metro that invented the suburb shows a distribution of these workers throughout the region except in the very highest-cost areas like the beaches, Beverly Hills and San Marino.

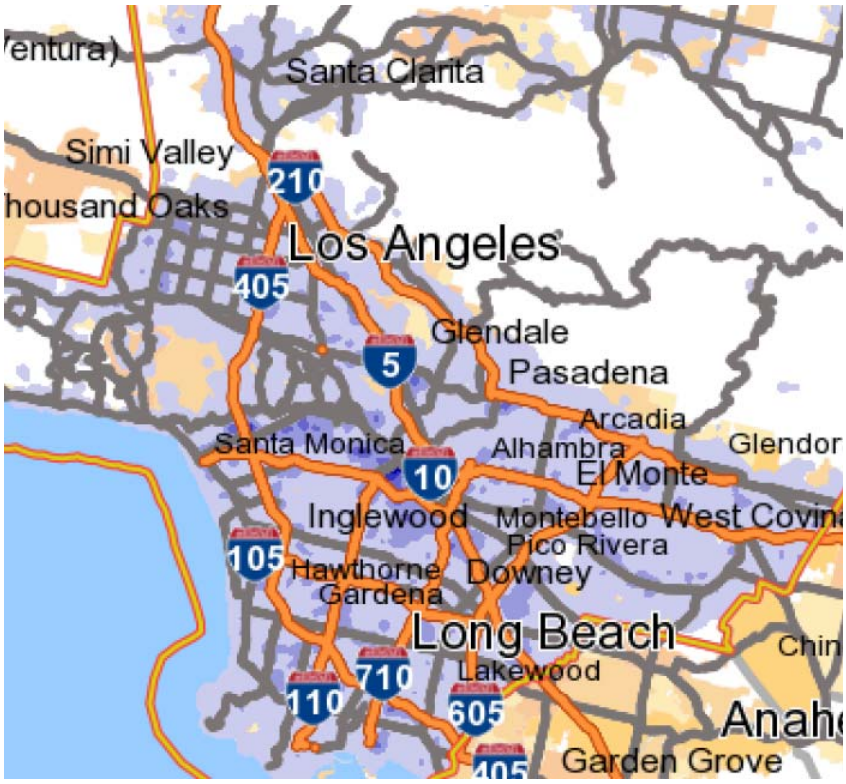
Exhibit 9, which shows the place of work for the same group of workers, is even more diversified. These workers are employed very evenly throughout the region. The differences between the places of work and the places of residence are part of what contributes to Los Angeles County's famous traffic congestion patterns. While these charts do not separate between the high-entry skill and low-entry skill sectors provided in Exhibit 7, both groups are important to Los Angeles County's role as an opportunity economy. The lower skill sectors represent the important transition from poverty as the lower income group moves up to the middle class, while the second group represents the hope for the next generation of these workers that they may be able to ascend to the upper middle class and even upper income class through hard work, training and initiative.

Exhibit 8—Middle Income Workers Place of Residence, 2011



SOURCE: Bureau of the Census, Longitudinal Employer-Household Dynamics.

Exhibit 9—Middle Workers Place of Work, 2011



SOURCE: Bureau of the Census, Longitudinal Employer-Household Dynamics.

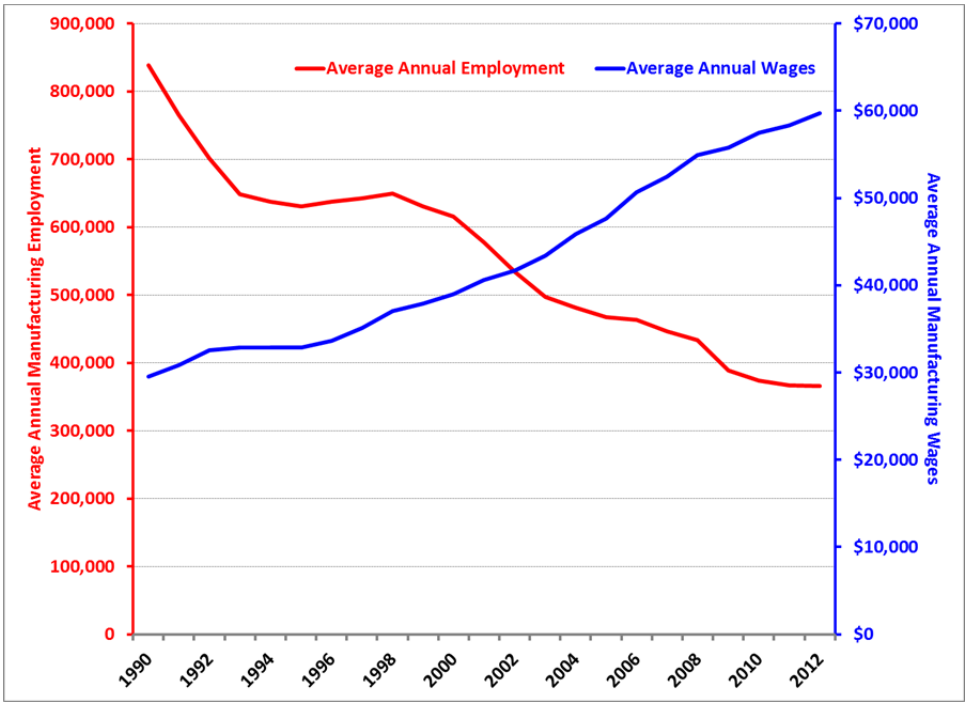
It is this diverse job landscape that allows Los Angeles County to continue to serve as a powerful place of opportunity for these two groups.

Los Angeles County as a Base of Opportunity for Poorer Californians

Nearly every metro in the country has been chasing the sexier, high-wage jobs found in the information, biomedical, and entertainment industries—all areas where Los Angeles County has had some historical strength. The battle over entertainment—and especially movie filming has been particularly messy and difficult—in part because of LA's historical dominance in the area and the extent to which Hollywood really did inspire many generations of Americans to come to California to pursue their Golden Dreams.

What is more impressive is Los Angeles County's historical strength in more mundane and less glamorous fields like manufacturing and trade. Even though the manufacturing base in Los Angeles County is nowhere near as strong as it once was, Exhibit 10 shows that it still manages to employ more than 360,000 Angelenos and to provide solid wage growth for those still in the sector.

Exhibit 10—Manufacturing Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

The sector has experienced a consistent decline over the past four decades—losing out to other states and nations who can offer either significantly cheaper labor or a

higher quality of life for workers at a lower price. It is worth noting that, even in the current "on-shoring" trend starting to materialize in manufacturing, Los Angeles County has not made major headway. Even after paying a disproportionate share of the "peace dividend" associated with what was thought to be the end of the Cold War, Los Angeles County is still the largest single manufacturing area in the United States as seen in Exhibit 11.

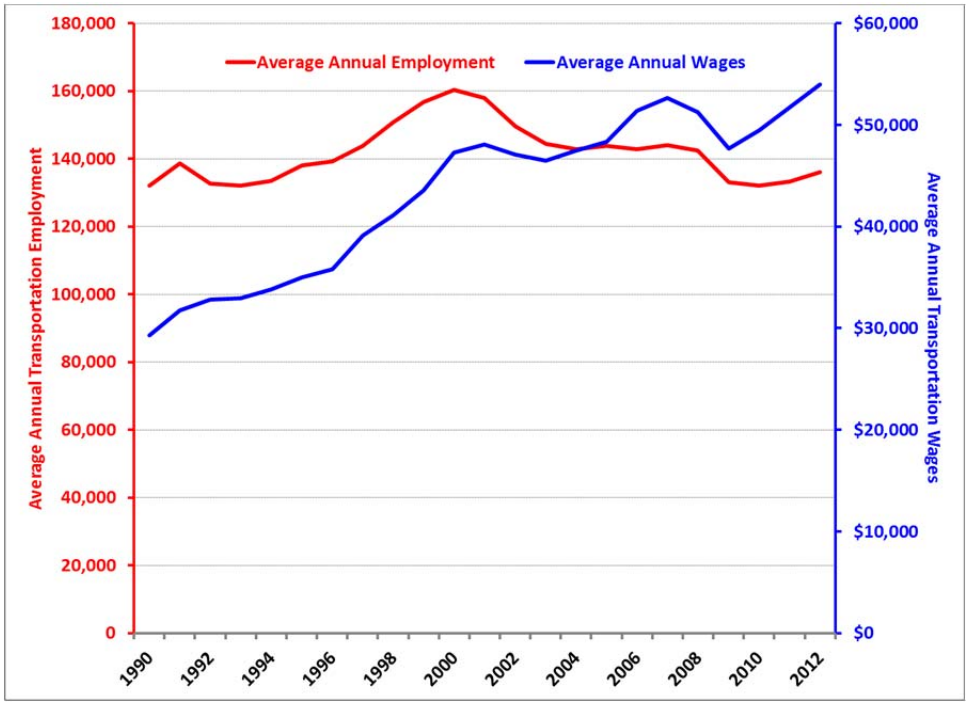
Exhibit 11—Top Ten Metro Areas with Largest Number of Manufacturing Jobs, 2013 ***(thousands of jobs)***

	Metropolitan Statistical Area or Division	Manufacturing Jobs
1	Los Angeles-Long Beach-Glendale, CA Metropolitan Division	360.5
2	Chicago-Joliet-Naperville, IL Metropolitan Division	314.9
3	Houston-Sugar Land-Baytown, TX	255.4
4	Minneapolis-St. Paul-Bloomington, MN-WI	184.0
5	Seattle-Bellevue-Everett, WA Metropolitan Division	169.0
6	Dallas-Plano-Irving, TX Metropolitan Division	162.9
7	San Jose-Sunnyvale-Santa Clara, CA	158.7
8	Santa Ana-Anaheim-Irvine, CA Metropolitan Division	158.6
9	Warren-Troy-Farmington Hills, MI Metropolitan Division	150.5
10	Atlanta-Sandy Springs-Marietta, GA	150.4

SOURCE: Bureau of Labor Statistics, Current Employment Survey.

Trade and transportation is another area of strength for Los Angeles County and a key cornerstone of the opportunity economy. Fortunate to be the point closest to our main extra-continental trading partners (Japan and then China), the ports of Los Angeles and Long Beach are the two busiest/largest ports in the United States. While the widening of the Panama Canal and the expansion of cross-border trucking threaten to undermine some of this natural advantage, Los Angeles continues to be a powerful hub for trade and transportation—both rich sources of opportunity for the region's lower-skill workers, as shown in Exhibit 12.

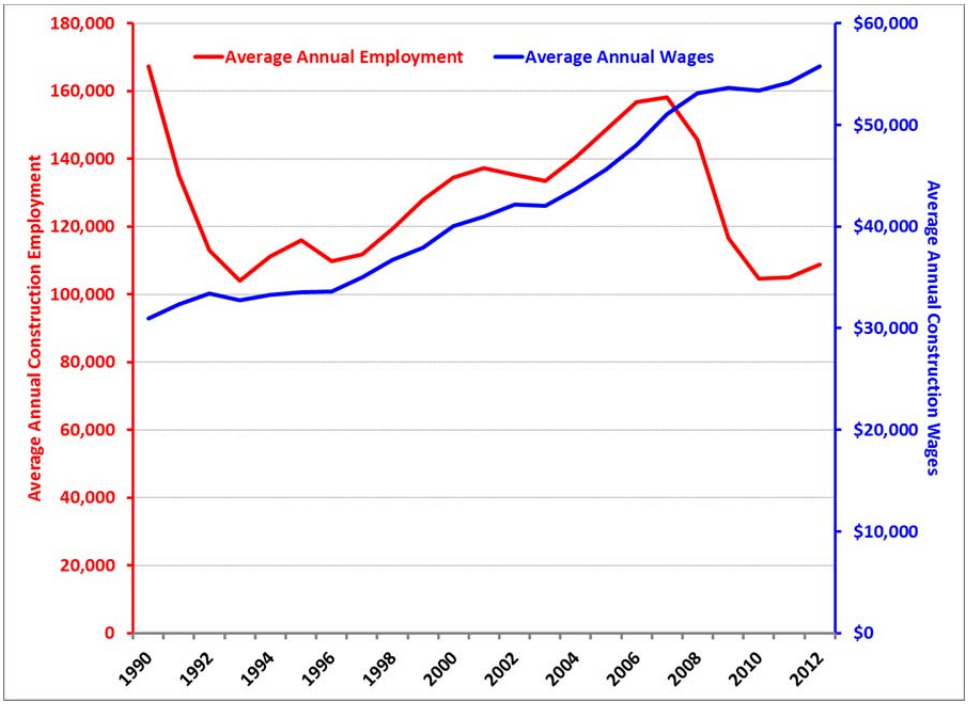
Exhibit 12—Transportation Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

Finally, until the energy spikes and the Great Recession hit in the late 2000s, California was one of the hottest geographies for construction and real estate development in the United States. Exhibit 13 shows the employment and wage trends over the past two decades. The market collapse in the early 1990s is readily evident when the defense industry rollback led to the elimination of 400,000 jobs in LA County and many of those workers sought new opportunities in other locales. Median home prices collapsed during this period, losing some 60 percent of their value—a collapse unrivaled until the housing bubble burst in 2008 and 2009. During the peak of the housing bubble, Los Angeles County developers were literally importing workers from the Midwest and other regions to staff new projects. Hopefully the uptick over the past couple years portends well for sector as this is a powerful opportunity engine for the County. With its well-structured apprenticeship models and a surplus of positions, this sector has been one of the region's key sources of new jobs. As the U.S. economy begins to recover, and a surging interest in the U.S. real estate market from abroad, this will be one of the key areas to watch.

Exhibit 13—Construction Sector Employment and Wages, Los Angeles County, 1990-2012



SOURCE: California Employment Development, California Regional Economies Employment Series.

CHAPTER THREE—UNDERSTANDING HOW THE STATE'S ENERGY POLICY AFFECTS THAT ENGINE

So how do California's energy policies affect Los Angeles County's engine of opportunity? The key lies in the ways that the state's new energy policy will change the costs experienced by both its workforce and its employers in the future. Explicitly built into the design of AB 32 is the intent to reduce GHG emissions not only through regulated caps that decline in value, but through natural market mechanisms by driving the prices of targeted activities higher—to make them more expensive. At the top of the targeted activities are three critical components of the state's energy economy—electricity generation, natural gas provision, and the consumption of fuel for transportation (gasoline and diesel). All three of these have important implications for the state's economy as AB 32 drives the price of all three of these essential resources higher.

INTENT AND MECHANISM OF THE AB 32 CAP AND TRADE MODEL

In its original *Scoping Document* and the May 2014 revision, the California Air Resources Board explicitly recognized the dramatic effect that AB 32 would have on the energy sector in California stating, "Reducing energy-sector emissions to near zero over the long-term will require wholesale changes to the State's current electricity and natural gas systems."[6] While much of the focus in the analysis is away from the cap-and-trade market and on conservation, there are two important threads that are important to remember in this analysis: (1) much of it is predicated on very long-term strategies like revising the building code, changing zoning laws, and redesigning highway infrastructure while at the same time calling for major reductions (40 percent by the CARB's accounting) in GHG emissions by 2020 – a mere six years from now; and (2) many of these revisions count on a HIGH cost of energy as the wedge to force businesses and consumers to kick their energy habits and make the significant personal investments in new technologies and resources that will allow the projected energy savings to materialize.

The timing issue is a major challenge. Even as, and if, the state is successful in imposing zero net energy requirements on the state's building codes and thus onto all localities by 2020 or even 2030, these will not significantly change emissions in

[6] California Air Resources Board, *First Update to the AB 32 Scoping Plan*, May 2014, http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm, accessed July 2014.

the short run. While a prudent step looking ahead, these cannot be seen as significant contributors to the current challenge of reducing emissions to 1990 levels by 2020. Instead that burden must fall on activities that happen in a much shorter span. Since the CARB identifies the energy sector as contributing 50 percent of the state's GHG emissions, that burden will fall disproportionately there.

To the second point above, driving up the costs of energy will necessarily be the key vehicle for generating many of the energy efficiency "savings" needed to reach state goals. Not only are they counted as a reduction in expenditures because people are buying less energy (albeit it at a much higher price), the extra disposable income they represent are key to the predicted increases in economic activity needed to offset the higher costs. This part of the argument seems in some ways self-contradictory.

The other benefit cited in the economic models is a flurry (as yet unrealized) of new manufacturing in California fueled by the newly created need for more efficient technologies. Again, the monies required to purchase these investments will be removed from individual's and business' pockets. Underlying all of this is a presumption that these costs (argued to be quite low on net) will just be passed along to the consumers—who by definition will then be made less well off. It is possible the world will unfold as predicted where the wins will truly offset the losses. However, the losses are quite certain (intentionally-created higher costs) while the gains are much more uncertain and may not materialize.

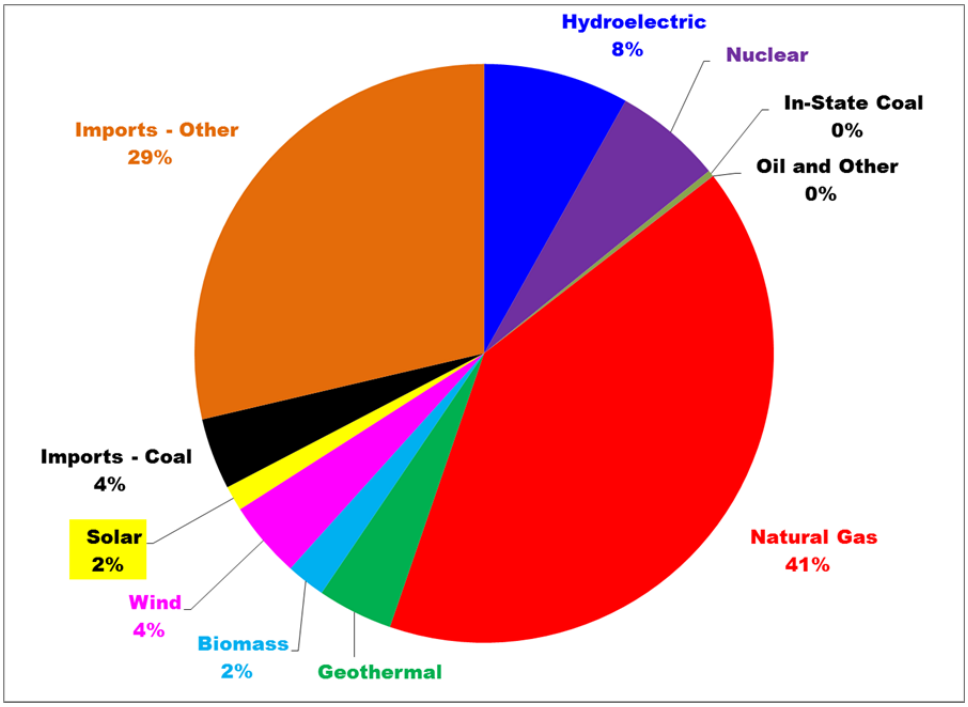
The bottom line is that prices for energy—including electricity, natural gas and fuel prices—have risen by design and will continue to rise under the implementation of AB 32. Last August, the California Independent System Operator (CAISO)—the primary government agency responsible for ensuring stability in the California electricity market—noted a fifteen percent price increase for electricity directly attributable to the cap-and-trade markets.[7] While the CAISO has been silent on expectations for future costs, it is unlikely they will decline as the demand for them grows. Since the AB 32 is dependent on the rising energy costs driving energy consumers to turn to more efficient (and more expensive) technologies, the value of any given set of allowances (and hence their price) is certainly expected to rise.

[7] California Independent System Operator Corporation, *California ISO: Q2 2013 Report on Market Issues and Performance*, August 21, 2013, p. 41, http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm, accessed July 2014.

CONTEXT OF THE RISING ENERGY COSTS

It is important to note that increased costs from AB 32 are stacked on top of already high costs for energy. Furthermore, one of the key areas of enforcement under AB 32 will be to eliminate leakage within the state's natural gas pipeline infrastructure. The additional costs for these energy providers will be passed on not only directly to consumers and businesses who rely on natural gas, but also indirectly to electricity consumers through higher input prices as a significant part of the state's electrical generation from natural gas. AB 32 targets all sectors of the energy industry that produce emissions and the implementation contains provisions to ensure that the 29 percent imported in Exhibit 14 are also accounted for in the total carbon footprint of the generating or purchasing entity (in other words, we can turn to "carbon" sources outside the state to replace our domestic production).

Exhibit 14—Generation Sources of California Electricity, 2013

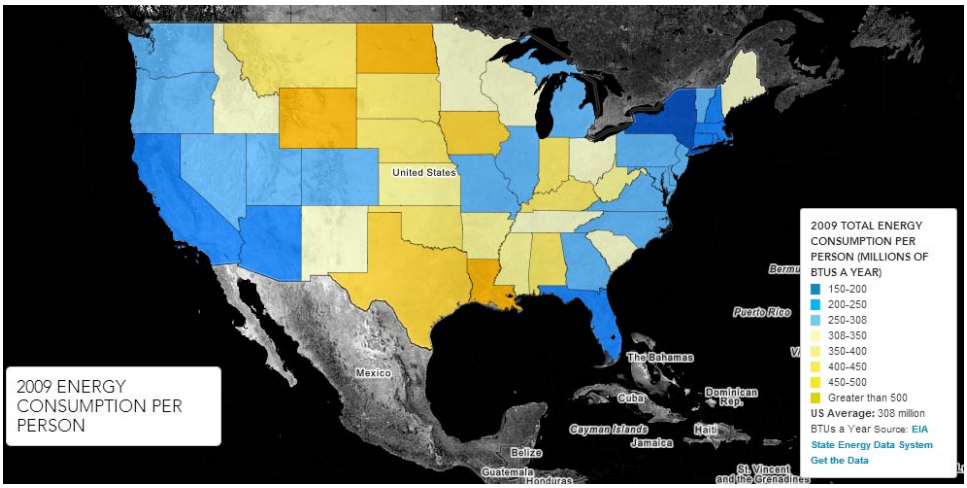


SOURCE: California Energy Commission, *Energy Almanac*.

CALIFORNIA IS ALREADY RELATIVELY EFFICIENT

One dimension of the debate lost in the current efforts to return California to its carbon emissions levels of 1990 as mandated by AB 32 is that California is already one of the most energy efficient states in the United States. Examining Exhibit 15 shows that only four states, New York, Rhode Island, Hawaii and Massachusetts had lower per capita electricity use than California in 2009. So the cuts made under AB 32 will be coming off of a fairly low starting point.

Exhibit 15—Map of Per Capita Energy Consumption



SOURCE: U.S. Department of Energy, http://energy.gov/maps/2009-energy-consumption-person, Accessed July 2014.

POTENTIAL SECTORAL EFFECTS OF RISING ENERGY PRICES

So what do rising energy prices mean to jobs in California? For the most part, energy costs are a small part of the costs of operations for a given business. Advocates for AB 32 are quick to claim that these costs are somewhere around three percent or less for most businesses. But there are several sectors where these effects will be concentrated—namely sectors where the capital to labor ratio is high, more specifically manufacturing, and those where energy costs drive a significant part of the cost structure of the business—namely trade, transportation and utilities. Construction can also be affected by energy costs, both on the fuel side in terms of acquiring and staging materials, and on the materials fabrication side. Cement, for example, is one of the most energy-intensive materials to manufacture. As these costs rise, so will the pressure on margins in what has been a lackadaisical construction sector.

Unfortunately, the three sectors discussed above—manufacturing; trade, transportation and utilities; and construction are also the three key sectors previously discussed that serve as essential gears driving the Los Angeles County engine of opportunity. This is one of the challenges of the policies imposed by AB 32. Even as the county more desperately needs these sectors to flourish to maximize the mechanisms for income mobility for Angelenos currently in poverty, the new costs imposed by AB 32 are aimed directly at these businesses. We must be careful moving forward not to throw a monkey wrench in the engine of opportunity in pursuit of our broader environmental goals.

MANUFACTURING OPPORTUNITY IS ALREADY WEAKENED AND PARTICULARLY VULNERABLE

Manufacturing employment within Los Angeles County has taken a beating over the past several decades—predating the defense drawdown of the early nineties, but accelerating since then. Exhibit 16 shows the patterns in manufacturing employment in Los Angeles County from 1990 – 2012. The sector overall has declined significantly from its earlier glory days, but as the yellow shading shows, nearly every subsector of manufacturing employment represents the opportunity to achieve a middle class income. It is also helpful to note that many of the subsectors have sustained their employment levels or even gained jobs since the bottom of the Great Recession in 2010. Looking down the list of subsectors (sorted by the number of jobs each sector represents), it is easy to see how these jobs represent solid entry-level opportunities for workers trying to break into the middle class.

Exhibit 16—Manufacturing Employment in Los Angeles County and Average Annual Wages, Selected Years

Industry	Average Employment 1990	Average Employment 2000	Average Employment 2010	Average Employment 2012	Average Annual Wages 2012
Transportation Equipment Mfg	152,858	72,092	45,950	46,212	$87,815
Apparel Mfg	89,085	92,697	47,674	45,617	$35,374
Fabricated Metal Product Mfg	80,544	61,868	40,173	42,956	$52,295
Computer & Electronic Product Mfg	124,474	71,000	48,759	41,528	$97,882
Food Mfg	55,623	45,653	39,221	39,179	$46,354
Chemical Mfg	30,202	25,890	18,989	19,856	$62,051
Miscellaneous Mfg	31,121	30,673	19,006	18,043	$61,517
Machinery Mfg	36,952	29,913	15,283	16,297	$62,876
Printing & Rel. Support Activities	37,647	30,277	16,520	14,786	$44,054
Plastics and Rubber Products Mfg	30,262	24,871	13,611	13,558	$46,837
Furniture and Related Product Mfg	37,559	33,220	12,841	13,126	$36,552
Electrical Equipment, Appliance, and Component Mfg	26,620	14,026	9,406	9,548	$58,455
Primary Metal Mfg	17,568	13,018	6,952	7,126	$50,525
Paper Mfg	18,794	13,434	7,176	7,041	$56,016
Textile Mills	8,199	14,285	7,228	6,732	$32,174
Nonmetallic Mineral Product Mfg	17,710	12,211	5,234	5,357	$46,178
Beverage and Tobacco Product Mfg	6,898	4,319	4,964	5,138	$61,362
Petroleum and Coal Products Mfg	11,546	5,929	4,318	4,154	$117,242
Textile Product Mills	11,939	10,009	4,123	3,993	$37,403
Wood Product Mfg	8,968	6,447	3,721	3,023	$33,119
Leather and Allied Product Mfg	4,383	3,669	2,339	2,256	$31,966
Total	**838,952**	**615,501**	**373,488**	**365,526**	

SOURCE: California Employment Development Department California Regional Economies Employment Series.

Concurrent with the declines in employment, manufacturing has seen a rise in salaries in the sector as firms invest in capital equipment to maximize the production of each individual worker, as seen in Exhibit 16. As a consequence of this increasingly technology-based manufacturing, workers necessarily must have a higher level of skill (thereby justifying the higher wages). While this has the beneficial effect of providing workers with higher wages, it is also a downside in that the number of jobs where relatively unskilled workers can start their careers and gain marketable human capital quickly decline in numbers. There are still many opportunities in the 365,000 jobs for the sector to continue as a source of opportunity for the lower end of the skills distribution in the Los Angeles County economy, but they continue to dwindle.

Exhibit 17—Manufacturing Average Annual Wages, Selected Years

Manufacturing Subsector	Average Annual Wages 1990	Average Annual Wages 2000	Average Annual Wages 2010	Average Annual Wages 2012
Petroleum and Coal Products Manufacturing	50,876	83,074	100,215	117,242
Computer and Electronic Product Manufacturing	38,813	62,944	92,515	97,882
Transportation Equipment Manufacturing	38,794	54,826	83,977	87,815
Machinery Manufacturing	31,678	43,151	59,348	62,876
Chemical Manufacturing	31,111	42,075	64,091	62,051
Miscellaneous Manufacturing	23,453	40,710	57,242	61,517
Beverage and Tobacco Product Manufacturing	37,967	49,180	60,148	61,362
Electrical Equipment, Appliance, and Component Mfg	25,559	33,934	55,229	58,455
Paper Manufacturing	30,612	41,369	53,443	56,016
Fabricated Metal Product Manufacturing	26,627	35,352	49,166	52,295
Primary Metal Manufacturing	26,317	36,249	46,177	50,525
Plastics and Rubber Products Manufacturing	21,615	30,683	42,606	46,837
Food Manufacturing	25,071	35,932	44,476	46,354
Nonmetallic Mineral Product Manufacturing	27,831	33,862	42,392	46,178
Printing and Related Support Activities	28,461	38,756	44,033	44,054
Textile Product Mills	19,056	26,277	35,262	37,403
Furniture and Related Product Manufacturing	19,915	26,803	35,617	36,552
Apparel Manufacturing	15,968	19,248	34,918	35,374
Wood Product Manufacturing	19,963	25,142	33,504	33,119
Textile Mills	25,981	26,195	30,639	32,174
Leather and Allied Product Manufacturing	16,596	21,684	32,412	31,966
Manufacturing Overall	**29,548**	**38,976**	**57,499**	**59,729**

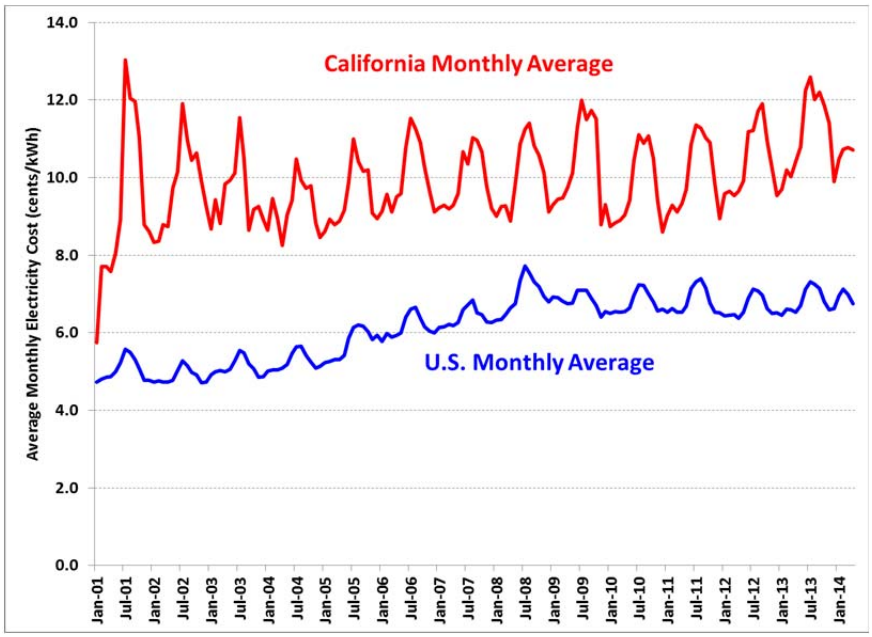
SOURCE: California Employment Development Department California Regional Economies Employment Series.

Another consequence of the growing role of technological capital in these firms is an increased reliance on energy for the core business functions of the enterprise. This growing dependence has also left the sector very vulnerable to the kinds of skyrocketing energy costs seen in Exhibit 188 below. In January 2001, the gap between the average kWh of electricity across the country was a mere 21 percent price premium for doing business in California. The deregulation of the California electricity market changed the model of business permanently and since the

calamitous events of that process, California industrial users have paid a premium for electricity—one that averaged 63 percent last year. In April, the average industrial user in the United States paid 6.75 cents per kWh while California users paid an extra 10.72 cents per kWh. Some of the effects of AB 32 have been factored into these prices already since electricity generation was one of the first sectors to realize the costs of the cap-and-trade system.

At the same time, the effects of the decreasing value of the emissions allowances will soon force electricity producers to dig deeper to find ways to reduce emissions or to purchase more scarce and expensive allowances to continue to operate within the law. This will force electricity prices even higher.

Exhibit 18—Average Monthly Electricity Costs, Industrial Users, January 2001 - May 2014



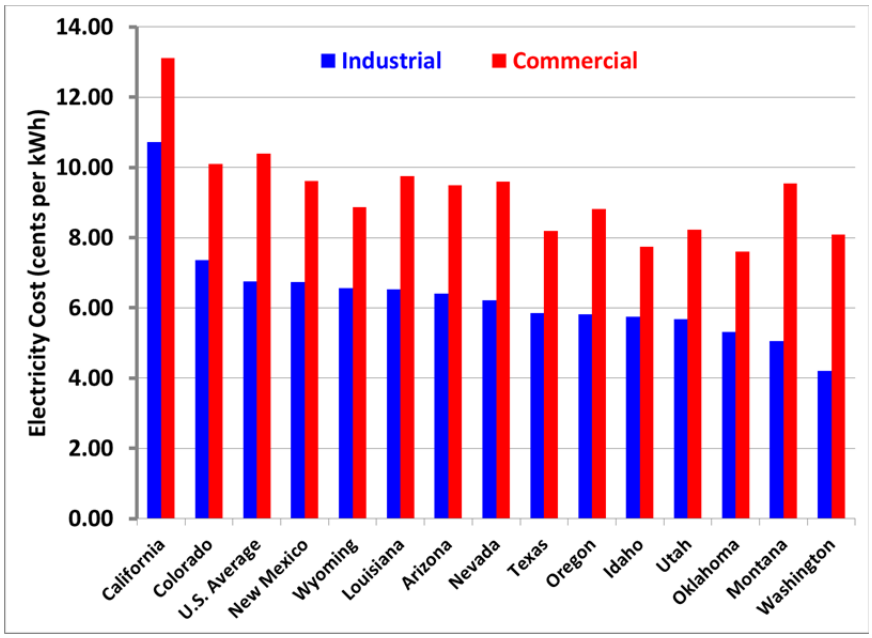
SOURCE: U.S. Energy Information Administration.

In the last year there has been a buzz in the employment development community about the recent trend called "on-shoring." It turns out that, even with very cheap labor, it is not always a better business decision to ship your production half way around the globe to place it into the hands of firms and contractors who may not share the same commitment to the product's brand and reputation only to pay a high price to ship the finished goods back to the United States for production. As a result, many firms are bringing their business back onto U.S. soil.

With an experienced workforce, California could be in a good position to intercept some of these jobs as they come back onshore. One problem, however, is that California faces, including Los Angeles County is the high cost of doing business here. The rising price of electricity does not help LA to compete against its

neighboring states and competitors. Exhibit 199 shows the price of electricity in several of the Western and Southern states likely to compete with California for these returning manufacturing jobs. This is particularly problematic from the perspective of creating opportunity for those trying to develop skills that are marketable in the workforce because these jobs are precisely the types of jobs that were initially ideal to move offshore to place in the hands of even more inexperienced workers overseas working for very low wages.

Exhibit 19—Retail Electricity Cost for Industrial Users, April 2014



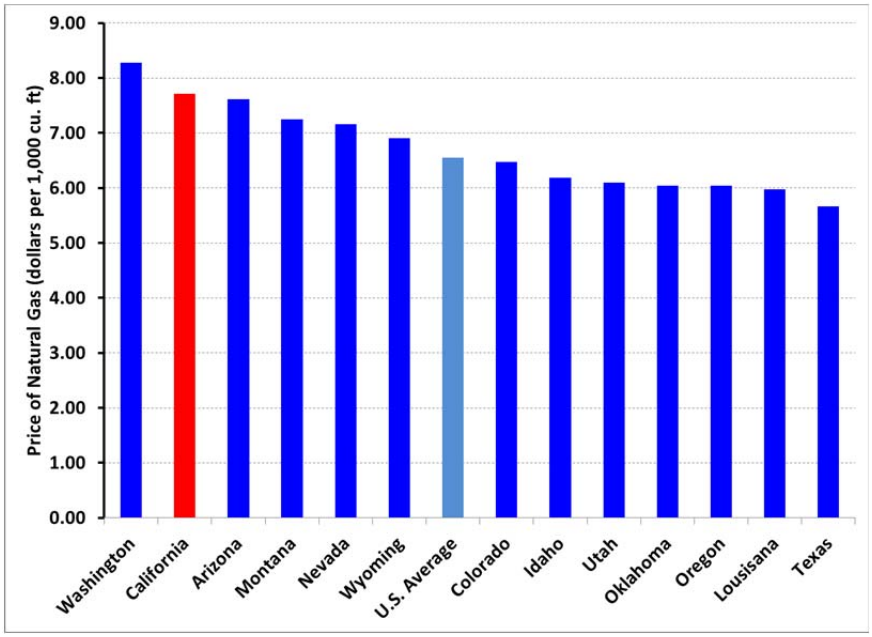
SOURCE: U.S. Energy Information Administration.

While the AB 32 models suggest (optimistically in the view of many) that net jobs in manufacturing will remain on net relatively flat, they do not ensure that the anticipated new manufacturing jobs will be located in the same places and require the same skills as the manufacturing jobs that were lost. In other words, some regions of the state—likely lower cost areas like the fringes of the Inland Empire or the Central Valley—are much more likely to attract any new facilities than those located in more expensive and strictly regulated urban counties like Los Angeles.

Another critical input to manufacturing is natural gas. Many industrial users build their fabrication and production processes around it instead of electricity since it is often more affordable per unit of head generated. Natural gas also burns more cleanly than many other fossil fuels and produces a smaller carbon footprint than gasoline and diesel, so it is anticipated that it will become an increasingly larger part of overall atmospheric GHG emissions in the future. Comparing California to the neighboring and competing states in Exhibit 20, it is yet again, significantly higher than nearly all the states compared. California's price is in fact 17.7 percent higher than the national average and higher than more than 33 states in the middle of a cold winter when gas is at a premium in the Northeast and northern Midwest. Driving

these prices even higher can only hurt manufacturers who are dependent on this energy source. %%%%

Exhibit 20—Prices of Natural Gas for Industrial Users, February 2014



SOURCE: U.S. Energy Information Administration.

TRADE, TRANSPORTATION AND WAREHOUSING ARE UNDER PRESSURE

One key aspect of a successful city identified in the work on opportunity urbanism was the need for the city to be at a crossroads of some sort and to find ways to leverage that location. With a huge share of transoceanic trade centered on China, good weather allowing year-round access, and solid connections to rail and freeways, Los Angeles is one of the premier trade locations in the United States. According to the American Association of Port Authorities, the Ports of Los Angeles and Long Beach are among the busiest in the United States as shown in Exhibit 21 ranking 1st and 4th in the total value of trade passing through. Even by tonnage Los Angeles and Long Beach rank a respectable 4th and 8th overall nationally.

Exhibit 21—U.S. Ports by Value of Trade, Calendar Year 2013, In Millions of Dollars

Total Trade		
Rank	Port/State	Dollars
1	Los Angeles, CA	$285,442
2	New York/New Jersey	$201,429
3	Houston, TX	$168,338
4	Long Beach, CA	$109,304
5	Savannah, GA	$70,934

Source: American Association of Port Authorities, *U.S. Waterborne Trade Port Rankings by Cargo Volume 2013.* Analysis of U.S. Census data.[8]

Los Angeles has invested heavily in the infrastructure to build that capacity. The Alameda Corridor is a 20-mile critical rail link between the port and the region's primary intermodal rail link, just east of downtown Los Angeles. The $2.4 billion project took more than 20 years to develop and construct and serves as an essential part of Los Angeles' economic engine. Current plans to expand the link further eastward and to build "inland port" customs areas to the north and east of Los Angeles are receiving renewed attention as the economy begins to show signs of recovery.

Overall, the Port of Los Angeles alone claims linkage to some 1.1 million jobs in California and 3.3 million jobs across the United States.[9] The Port of Long Beach makes more modest claims accounting for 371,000 jobs in California and 1.4 million jobs across the country.[10] Not surprisingly, many of those jobs are located in Los Angeles County. Exhibit 22 shows the historical context of this important opportunity sector within Los Angeles County. Most striking is the number of subsectors included in this category highlighted in yellow, representing the subsectors which can serve the important upward income mobility function. In contrast to manufacturing, employment in this sector has held relatively steady over time and, while not back to the historical norms, the sector is showing signs of growth post-Great Recession.

[8] Accessed via internet at http://aapa.files.cms-plus.com/Statistics/U.S.%20WATERBORNE%20FOREIGN%20TRADE%202013%20PORT%20RANKING%20BY%20CARGO%20VALUE.pdf, Accessed July 2014.

[9] Port of Los Angeles, "Economic Impact," http://www.portoflosangeles.org/finance/economic_impact.asp, Accessed July 2014.

[10] Port of Long Beach, "Economic Impacts, http://www.polb.com/economics/economics.asp, Accessed July 2014.

Exhibit 22—Trade, Transportation and Utilities Employment in Los Angeles County and Average Annual Wages, Selected Years

Trade, Transportation and Utilities Subsector	Average Employment 1990	Average Employment 2000	Average Employment 2010	Average Employment 2012	Average Annual Wages 2012
Wholesale Trade	251,060	222,933	203,115	211,286	$58,540
Air Transportation	33,205	29,692	17,217	18,813	$67,314
Water Transportation	1,717	1,614	3,081	3,074	$64,017
Truck Transportation	40,628	32,311	25,217	25,194	$44,349
Transit & Ground Passenger Transportation	12,486	12,666	12,370	12,546	$30,151
Pipeline Transportation	586	423	612	602	$104,656
Scenic and Sightseeing Transportation	320	605	554	687	$25,300
Support Activities for Transportation	24,872	39,780	38,874	40,462	$61,353
Couriers and Messengers	9,061	24,921	18,816	18,558	$45,113
Warehousing and Storage	9,154	18,296	15,368	16,024	$48,006
Utilities	17,558	12,450	11,732	12,521	$100,422
Total Trade, Transportation & Utilities	**383,089**	**383,241**	**335,224**	**347,246**	

SOURCE: California Employment Development Department California Regional Economies Employment Series.

As a port with many goods entering the country, the opportunity to serve as a major trading hub is significant and, as Exhibit 22 shows, the wholesale sector plays a leading role in the employment performance of the county. While a significant fraction of this activity is likely directed at the distributional chain necessary to support the retail sector for some 15 to 20 million southern Californians, the presence of the port also ensures a robust wholesale sector looking outside the region as well.

Exhibit 23—Wholesale Trade Subsector Employment & Wages, Selected Years

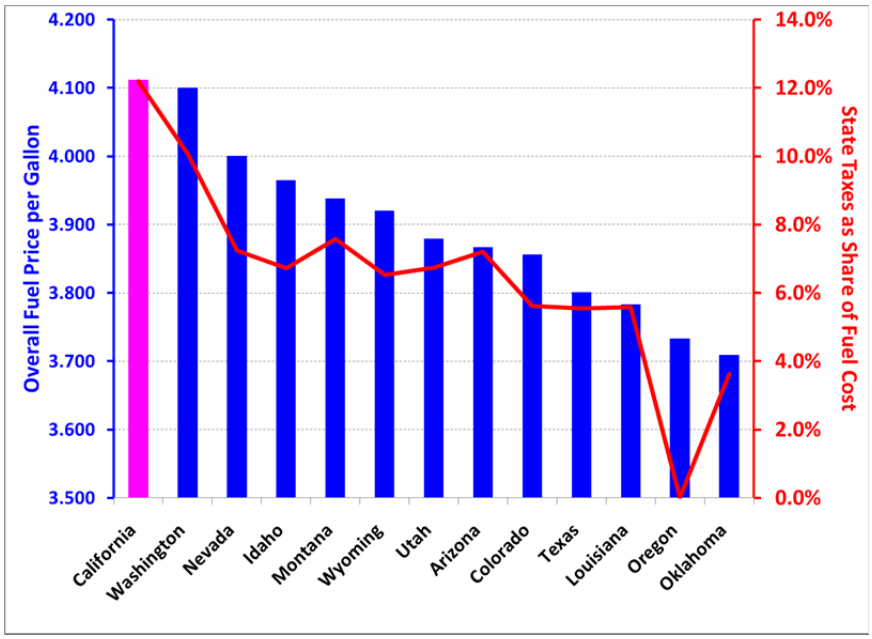
Wholesale Trade Subsector	Average Employment 1990	Average Employment 2000	Average Employment 2010	Average Employment 2012	Average Annual Wages 2012
Motor Vehicle & Motor Vehicle Parts &Supplies	16,974	16,220	10,471	10,724	54,014
Furniture &Home Furnishing Merchant Wholesalers	6,810	10,037	7,219	7,582	51,635
Lumber & Other Construction Materials Merchant Wholes	5,501	4,336	4,589	4,270	49,163
Professional & Commercial Equipment & Supplies Merc	30,991	23,749	15,292	15,895	75,252
Metal & Mineral (except Petroleum) Merchant Wholesale	7,057	5,710	4,769	4,698	69,078
Electrical & Electronic Goods Merchant Wholesalers	19,989	15,404	11,823	12,635	66,830
Hardware, & Plumbing & Heating Equipment & Supplies	11,097	9,834	7,871	8,283	62,096
Machinery, Equipment, & Supplies Merchant Wholesalers	25,010	18,130	13,159	13,420	70,517
Miscellaneous Durable Goods Merchant Wholesalers	17,892	21,033	18,195	19,380	58,274
Paper & Paper Product Merchant Wholesalers	9,488	6,477	4,835	4,755	57,056
Drugs & Druggists' Sundries Merchant Wholesalers	4,543	5,167	5,849	6,317	70,647
Apparel, Piece Goods, & Notions Merchant Wholesalers	13,829	19,334	20,525	22,137	49,528
Grocery & Related Product Wholesalers	25,664	28,006	33,032	34,248	49,242
Farm Product Raw Material Merchant Wholesalers	167	134	198	221	56,167
Chemical & Allied Products Merchant Wholesalers	5,319	4,385	4,218	3,959	64,169
Petroleum & Petroleum Products Merchant Wholesalers	2,087	1,802	1,433	1,380	79,867
Beer, Wine, & Distilled Alcoholic Beverage Merchant W	4,301	2,146	2,997	3,423	61,892
Miscellaneous Nondurable Goods Merchant Wholesalers	12,667	15,137	15,485	16,887	44,260
Wholesale Electronic Markets and Agents & Brokers	31,675	15,890	21,154	21,073	66,269
Wholesale Trade Overall	**251,060**	**222,933**	**203,115**	**211,286**	**58,540**

SOURCE: California Employment Development Department California Regional Economies Employment Series.

For this sector, the energy cost bumps associated with electricity will play a minor role in driving costs, but more important are the combination of several initiatives to replace diesel trucks with cleaner-burning CNG vehicles while, at the same time, the state is working through cap-and-trade to drive up the cost of natural gas.

Perhaps more problematic, however, for the trade, transportation and warehousing sectors is the plan to add vehicle-based carbon emissions to the cap-and-trade regime in 2015. California already has the highest fuel prices of any western state, as evidenced in Exhibit 24. Part of what drives California's high cost is its current 44.7 cents per gallon tax—representing an functional surtax of 12 percent on the overall fuel price. When gasoline and diesel are folded into the AB 32 regulation scheme, it will increase that tax by an estimated 20 to 76 cents per gallon.

Exhibit 24—Fuel Prices by State, July 2014



SOURCE: ProMiles.com, Daily Fuel Prices, http://www.truckmiles.com/FuelPrices.asp, accessed July 2014.

The timing of these fuel price increases could not happen at a worse time for the Ports of Los Angeles and Long Beach. They will phase into the prices encountered by shippers at the same time that the expansion of the Panama Canal is slated to be completed. If these costs are added to the relatively narrow margins that exist in the shipping industry, it may easily persuade shipping companies to bypass their ports of call in southern California in favor of welcoming destinations in Ensenada and British Columbia (already cutting into LA County port market shares), Houston, Shreveport, Galveston, Mobile, Tampa and Miami. The point is that cargo that is not offloaded in Los Angeles County will not provide opportunity-boosting jobs for workers in Los Angeles County.

CONSTRUCTION LANGUISHES UNDER AN UNCERTAIN REAL ESTATE MARKET

Construction is the last of the three sectors on which this analysis will focus. Construction is one of the most cyclical businesses out there. Small changes in the demand for developed properties can have long-term impacts on the industry. Twenty-two years ago, when real estate values collapsed in southern California, much of the rest of the country continued with fairly normal real estate market levels. California's was so severe because employers like TRW were literally laying off 10,000-15,000 employees at the same time from the same few square miles of land. Neighborhoods that surrounded these locations were decimated because there were suddenly that many houses for sale at the same time. It is also important to note that the market recovered steadily and quickly after just a brief

lapse and by 1996 homes had regained most of the value they held before the recession.

The bursting of the real estate bubble in the Great Recession, however, was a landmark event the history of California's construction industry and fundamentally different than prior downturns. The region still has not fully begun to reassemble its momentum for real estate some four years later and it is perceived by everyone as tenuous at best. In this instance, those dependent on construction did not just experience a slowdown, they experienced a complete decimation of their income streams. In many instances, people who worked in the construction trades found new permanent jobs. One construction worker who owned his own concrete pumping truck, for example, became a bus driver for a local municipal bus system. In many cases, they left the trade. Those who did so with some success will almost certainly remain away when the economy does begin to turn around.

This is good news for opportunity-seekers in that there will likely be more opportunities for hard workers to join this sector of the economy as the market starts to heat up again. There are some signs this is beginning to happen. Median home prices for Los Angeles County hit $500,000 in the month of May 2014—the first time it has crossed that threshold since December 2007. This is up 66 percent from January 2012 when the median home price was a mere $305,000.[11]

Exhibit 25 shows how the Construction sector fits into the opportunity urbanism model—nearly every subsector in Construction has a wage above the $40,000 threshold. Even those subsectors that do not reach that mark are within 10 percent with the exception of siding contractors. With the prospect of a significant out-migration of experienced workers to other sectors because of the prolonged nature of this recession, opportunity may yet surge in Construction.

Energy prices, however, may put somewhat of a damper on the pace at which this sector recovers. While there is a relatively small inventory of homes on the market and demand is freshening, actual construction has been slow to accelerate. Even builders with entitlements and permits are moving cautiously to ensure that the market does not take a step backward before it moves ahead. The sector is significantly impacted by electricity and fuel prices. Many of the materials necessary for construction are energy intensive in their development. Cement manufacturing, for example, requires more electricity than almost any other type of manufacturing. Furthermore, as one builds a major project, the materials must be

[11] Data from newspaper article by Howard Fine, "Home Prices Cross Threshold," in the *Los Angeles Business Journal*, 6/20/2014, accessed July 2014, ttp://labusinessjournal.com/news/2014/jun/20/home-prices-cross-threshold/.

transferred to the site via trucks which run on what is to become increasingly expensive fuel.

Exhibit 25—Construction Subsector Employment and Wages, Selected Years

Construction Subsector	Average Employment 1990	Average Employment 2000	Average Employment 2010	Average Employment 2012	Average Annual Wages 2012
Residential Building Construction	24,557	17,424	15,589	16,222	$48,812
Industrial Building Construction	2,082	1,767	1,293	1,645	$80,410
Commercial & Institutional Building Construction	14,632	12,799	8,278	9,155	$73,606
Water & Sewer Line & Related Structures Constr	2,772	2,409	2,018	1,935	$73,405
Oil & Gas Pipeline & Related Structures Constr	2,048	761	1,782	2,678	$71,231
Power & Comm Line & Related Structures	1,983	1,506	1,727	1,683	$98,626
Land Subdivision	6,370	2,852	1,657	1,720	$81,903
Highway, Street, & Bridge Construction	3,771	3,625	2,832	3,138	$79,409
Other Heavy & Civil Engineering Construction	6,427	2,861	1,217	1,229	$83,181
Poured Concrete Fdn & Structure Contractors	4,314	2,935	2,839	2,750	$51,648
Structural Steel & Precast Concrete Contractors	2,814	2,997	1,854	2,104	$57,443
Framing Contractors	3,017	2,811	1,542	1,415	$35,869
Masonry Contractors	3,589	2,783	2,010	1,849	$43,455
Glass & Glazing Contractors	1,407	901	1,163	1,152	$63,074
Roofing Contractors	5,501	4,440	3,073	3,041	$42,829
Siding Contractors	156	127	125	122	$32,124
Other Foundation, Structure, & Building Ext Cont	560	705	876	672	$43,357
Electrical Contractors	20,202	19,588	14,425	14,490	$58,396
Plumbing, Heating, & Air-Conditioning Contractors	19,111	13,785	13,799	15,162	$52,657
Other Building Equipment Contractors	1,623	2,218	1,637	1,517	$73,730
Drywall & Insulation Contractors	13,500	10,879	5,268	5,201	$44,829
Painting & Wall Covering Contractors	5,284	5,260	4,129	4,135	$36,089
Flooring Contractors	2,362	3,050	2,006	1,927	$41,886
Tile & Terrazzo Contractors	2,324	2,246	2,084	1,703	$36,277
Finish Carpentry Contractors	3,829	2,256	1,985	2,085	$38,295
Other Building Finishing Contractors	1,248	1,518	1,302	1,516	$39,403
Site Preparation Contractors-Residential	4,225	3,342	2,539	2,481	50,031
All Other Specialty Trade Contractors	7,548	6,603	5,599	5,981	49,819
Total Construction	**167,256**	**134,448**	**104,648**	**108,708**	**55,764**

SOURCE: California Employment Development Department California Regional Economies Employment Series.

LOS ANGELES COUNTY ECONOMY OVERALL REMAINS VULNERABLE FOR SOME TIME TO COME

Generally speaking, these are tenuous times for the opportunity engine that is the Los Angeles County economy. Projections show slow to modest growth at best in most sectors and most economists agree that there will be at least one recession setback in the twenty years before AB 32's 2020 deadline.

Other sectors of the economy are also likely to be impacted by these rising energy costs—sectors that provide jobs to many individuals in this economy. For example, a 2004 study by Robert Mandelbaum of PKF Consulting found that utility costs are a major cost driver in the hotel industry and that escalating costs could seriously impact both pricing and business viability.[12]

But what is most disconcerting in the timing of the implementation of AB 32 is that its greatest impacts on energy will correspond to that tenuous time period over the next 18 to 24 months when the economy is most vulnerable. Equally of concern is the fact that the proposed (and planned) energy cost boosts will have the most deleterious effects on the three sectors that serve as the heart of Los Angeles County's opportunity-generating mechanisms: manufacturing, trade and transportation, and construction.

[12] Mandelbaum, Robert. "Hotel Utility Costs Need a Circuit Breaker," Hospitality Research Group, PKF Consulting, Atlanta, GA, http://www.hotelnewsresource.com/article9982.html, accessed July 2014.

CHAPTER FOUR—BALANCING OPPORTUNITY WITH ENVIRONMENT IN A WAVERING ECONOMY

The fundamental question for Los Angeles County, and California, is how to achieve the goals of AB 32 to reduce the state's carbon footprint while preserving the best dimensions of the County's unique opportunity economy. Not only is Los Angeles County a major part of the state's economy, but it is also uniquely situated to contribute more than its share to efforts to create opportunities for the state's most vulnerable populations—people living at the margin of subsistence while striving to get ahead.

Because of its longstanding role as a destination of choice for natives, immigrants, and migrants, Los Angeles County has a rich pool of ready workers seeking opportunity. The economy here is just beginning to show signs of restarting after a deep and painful retrenchment. It is critical that both local and state officials move cautiously not to derail that process.

PRUDENT TIMING IS CRITICAL

The goals of AB 32 are laudable and it is remarkable and, in true California fashion, Californians have come together to take the lead on an issue that has befuddled the UN, international organizations, and the scientific community. It reflects powerfully the can-do frontier spirit that has defined the state's history.

At the same time, there is a practicality that is essential in that same frontier spirit—if pushing the plow horse too hard looked like it might kill it, you slowed down and took an extra day to plow the field. We must be careful in California that, as we pursue the public good in AB 32, we do not get so focused on 2020 that we sacrifice the good that is found in our opportunity economy.

Just like healing from a sprained ankle, moving too aggressively or too quickly can set you back to where you started. As the County looks to three key opportunity sectors—manufacturing, trade and technology, and construction—to continue to provide new jobs and mobility to its more vulnerable populations, it is critical that the more diffuse goals of AB 32 not derail the effort before it begins.

The 2020 date was a goal written into legislation and is not driven by a natural cataclysm about to befall civilization in 2021 if the state falls short of the goal. As the state looks ahead, it should consider slowing the pace of implementation during the slower economic periods to ensure that AB 32 does not accelerate and amplify the downturns or unnecessarily obstruct and slow the recovery.

PROVIDE OFFSETS, EXEMPTIONS AND SUBSIDIES FOR CRITICAL ECONOMIC SECTORS

Because of the critical role in creating economic mobility that the three sectors discussed in this report play, they should be the focus of specific attention and interventions in the AB 32 implementation process that insulates them from some of the cost impacts that implementation will bring. The higher energy costs are already evident—almost from the day the cap and trade market began. The impacts on these industries are real and, while the companies did not necessarily depart the next day, the cumulative effects of these higher costs are moving them closer to making the same choice Toyota did to leave California.

Possible mitigation tools could include discounts on allowances, expanded offsets, flexibility to purchase extra allowances beyond the eight percent limit, special offsets for utilities, and tax credits targeted at key opportunity sectors.

There is another reason why these opportunity sector jobs are so important. Unlike youth who are being encouraged to pursue increasingly higher levels of education to build their human capital, the workers in these sectors will likely not have access to additional schooling to advance and improve their human capital and earning power. These jobs are the sole vehicle available to them to do so. The stakes are significant as well—if they fail to find a niche in the labor market, preferably one that will allow then to grow and advance, their alternative is to fall back on the County's already overtaxed social safety net. As such they move from economic contributors to consumers of scarce public resources.

COLLABORATE WITH INDUSTRY TO IDENTIFY THE UNINTENDED EFFECTS OF THE IMPLEMENTATION

The state has been quite diligent in estimating and anticipating the effects and dynamics of the plan to reduce GHG emissions. However, every economist knows that a Competitive General Equilibrium model is a crude instrument and only vaguely reflects the dynamic reality in which those plans unfold. The state should follow closely the impacts of elevated and escalating energy prices, not only on the sectors listed here, but also the multitude of other areas that will be impacted by the price increases. Low income households, for example, will eventually pay an increasing share of their incomes in electricity, natural gas, and (due to pumping costs) water bills. The proceeds raised by the implementation of these plans should be slated to mitigate the unintended or unnecessarily destructive effects of these plans before they go to other purposes.

Not only should there be oversight by the CARB, but the state should reach out to the respective professional associations and industry groups of the most deeply affected sectors to craft mitigation measures as the state moves forward. The firms who are bearing the costs of implementation should be deeply involved in helping to

identify the realistic and practical goals for what can be accomplished. Many of the assumptions behind the implementation of AB 32 include technologies that are not yet in viable commercial production. Developments like the "zero net energy" home, for example, are in experimentation but have not yet demonstrated evidence of commercial viability. Even electric vehicles are in their relative infancy in terms of commercially viable use.

ADDRESSING THE INTERACTIONS WITH OTHER DEVELOPMENTS

Finally, this analysis has focused on the importance of these opportunity sectors as critical to the future recovery of the County's economy. Los Angeles is not so unique that actions taken to mitigate the challenges in the region's economy created by higher energy prices would not work elsewhere if applied at the state level. There are many developments in the broader state, national and global economy that may redefine the prudent path forward.

The drought, for example, coupled with a hot, dry summer could drive energy prices dramatically higher. This could seriously harm the state economy. Similar volatility is possible in the natural gas markets. Conversely, if the state were to take action to more aggressively develop its considerable energy resources, it could serve to mitigate the costs and risks of these higher energy prices on the economy.

The state energy policies also interact with other policies intended to promote GHG mitigation—but they may not always be mutually compatible. For example, if the price of electricity were to surge significantly, it may be necessary to delay the state's plans to expand the number of electric cars on the state's roadways. If a serious and severe drought hits the Pacific Northwest, then the availability of hydroelectric power could drop precipitously and the state's renewable energy floor may need to be reconsidered.

The bottom line of AB 32 is a serious and significant commitment by Californians to reduce their energy footprint with a view to making an incremental contribution to reducing global GHG emissions. It is not a blood oath sworn to be completed as promised at all costs. Just as the loss of these opportunity sector jobs could cause severe and possibly irreversible job loss to these critical communities, other factors may arise which should give us pause to consider and sometimes reconsider our next step toward our goal.

Intrinsic in the AB 32 model and especially in the public agencies' planning is the presumption that, if the basic economic premise that if we raise the price of energy enough, people will use less of it. What is lost in that analysis is who will pay that increased price, both directly and with the loss of future economic opportunities that have been at the heart of the California Dream—opportunities that have been the shiny gild on the Golden State's role as the protector and supporter of that dream.