

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

THE
STATE
OF THE
REGION
2006

EXCERPT ON ENERGY SECTION
Complete report is available at www.scag.ca.gov

M E A S U R I N G R E G I O N A L P R O G R E S S





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(or almost 25 percent) in 1996, the lowest level since 1990. Since 1996, per capita disposal rates fluctuated somewhat and began to increase after 2002 to about 6.7 pounds per day in 2005. (Figure 60).

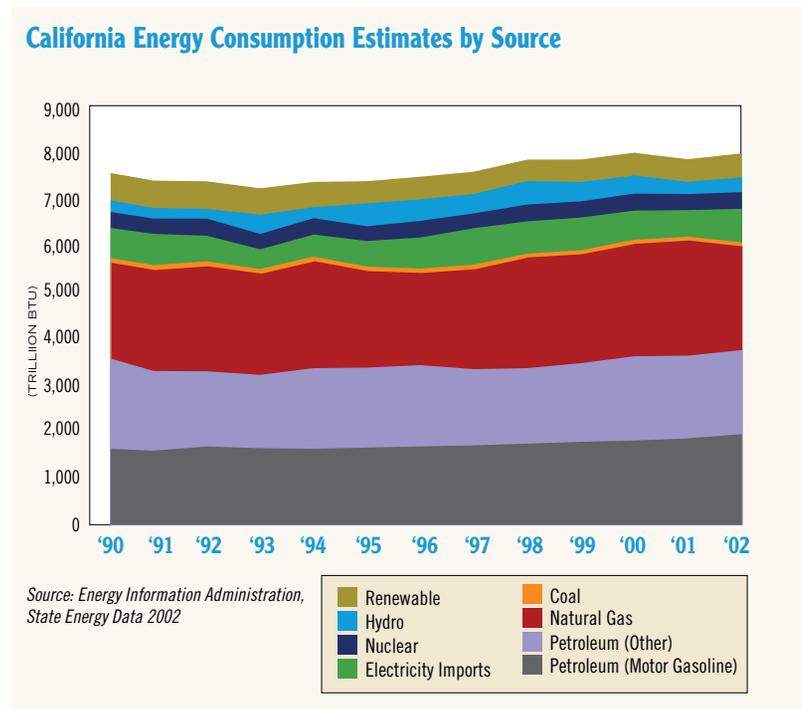
Energy

Why is this important?

Energy is a critical input for the production processes of the regional and national economy. In addition, it is essential for everyday life. Reliance on fossil fuels contributes significantly to global warming that would result in adverse

impacts on many ecological systems, human health as well as the economy. Furthermore, strong dependence of foreign imports greatly reduces the reliability and security of this vital resource.

Figure 61



How are we doing?

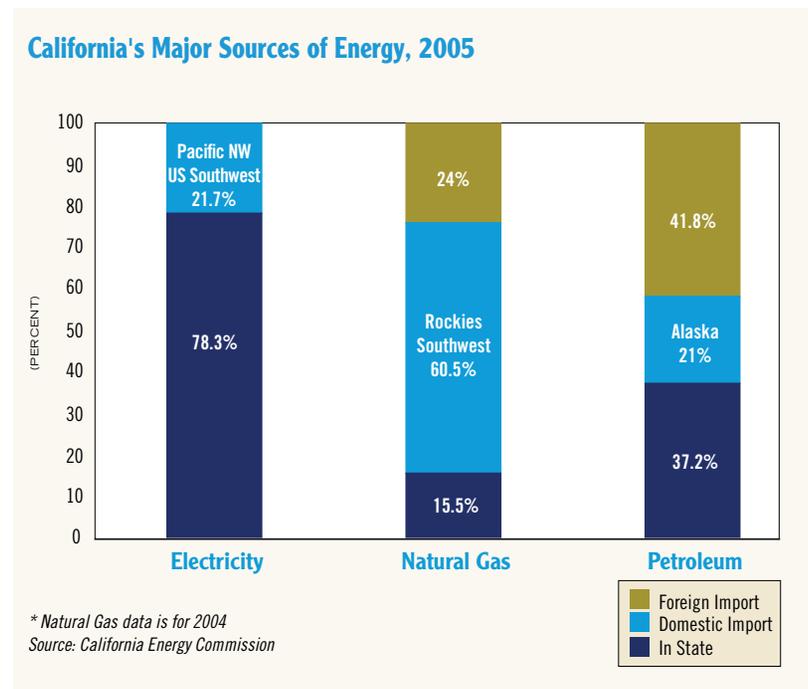
Energy use in California is predominantly fossil-fuel based (i.e. petroleum, natural gas and coal), accounting for almost 85 percent of the total consumption (Figure 61). In addition, California obtains nearly two-thirds of its energy from outside its borders, including 63 percent of petroleum, 84 percent of natural gas and 22 percent of electricity uses (Figure 62).

Based on the recent statewide inventory, petroleum accounted for about 47 percent of the total energy use, natural gas 28 percent and coal just below 1 percent.¹⁷ In addition, imported electricity (9 percent of the total energy use) was produced mainly by coal or natural gas. Other sources of energy include renewable (6.5 percent), nuclear (4.5 percent) and hydroelectric power



(4 percent). As to the energy consumption by sectors in California, transportation sector is the largest user of 39 percent, followed by the industrial sector of 24 percent. Commercial and residential sectors each used about 18.5 percent. For major energy sources such as petroleum and natural gas, the SCAG region accounts for about 45 percent of the total state use and is expected to have similar consumption patterns to that of the state in the shares of different energy sources.

Figure 62



At the national level, 86 percent of the total energy consumption is fossil-fuel based, almost the same proportion as that in California. However, the nation relies much more on coal (23 percent) and less on natural gas (23 percent) and petroleum (40 percent) than California. In addition, within the non-fossil fuels, the nation also relies more on nuclear (8.5 percent).

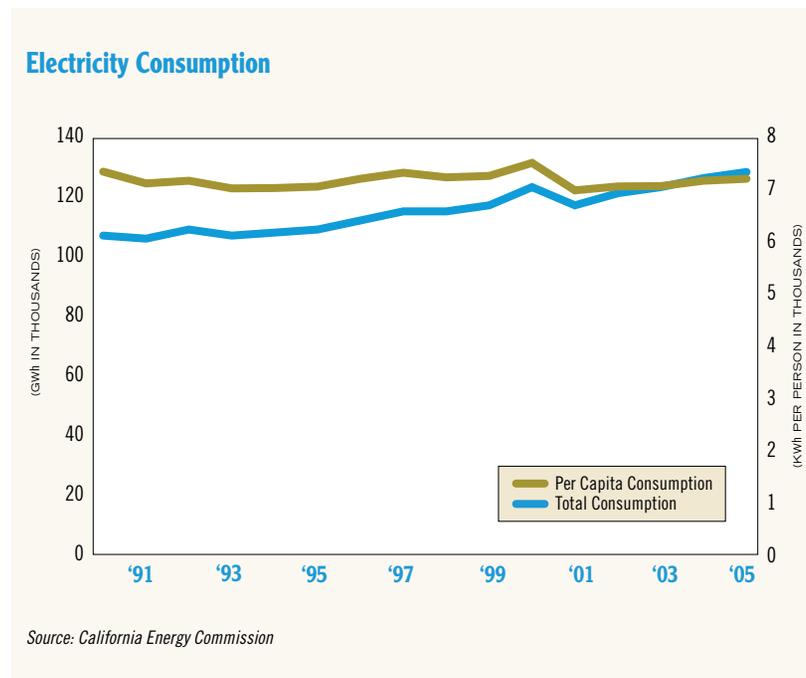
Electricity Consumption

In 2005, the SCAG region consumed almost 128,000 gigawatt-hours (GWh) of electricity, about 48 percent of the total consumption in the state (Figure 63). In



the region, electricity consumption increased 15 percent during the 1990s. Total consumption declined in 2001 after the electricity crisis but since then has been increasing about 1.3 percent per year, roughly keeping pace with the population growth. Hence per capita electricity consumption in the region is projected to remain relatively constant over the next 10 years, at about 7,100 kilowatt-hours (kWh) per person, somewhat below the state average of 7,500 kilowatt-hours (kWh) per person.

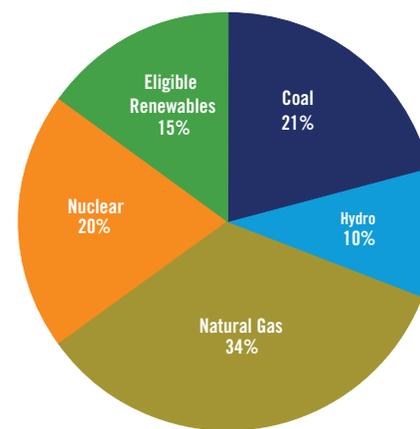
Figure 63



Fossil fuels accounted for 55 percent of the total sources for electricity generation in Southern California, including natural gas (34 percent) and coal (21 percent) (Figure 64). Compared with the state's energy mix, Southern California had a higher share of renewable (15 percent vs. 11 percent). Both Southern California Edison and Los Angeles Department of Water and Power (LADWP) have set targets to reach 20 percent using renewable energy. Southern California relied more on nuclear (20 percent vs. 14 percent) but less on hydroelectric power (10 percent vs. 17 percent) than the state as a whole.

Figure 64

Electricity Generation by Source, 2005



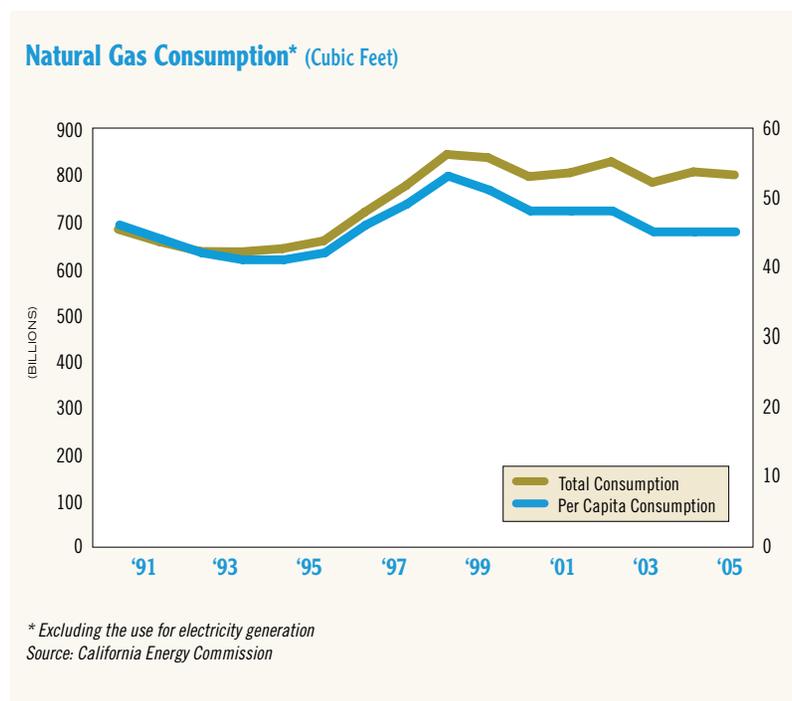
*Based on the combined mix of Southern California Edison and Los Angeles DWP
 Source: California Energy Commission, Southern California Edison, Los Angeles Department of Water and Power, July 2006

Natural Gas Consumption

Californians consumed about 6.25 million cubic feet per day (MMcfd) of natural gas in 2005, half of which were used in electric generation. Only 16 percent of the total natural gas consumption was produced in California. The remaining was imported from the Southwest (36 percent) and Rockies (24 percent) in the U.S. and from Canada (24 percent). For natural gas use, the SCAG region is served by the Southern California Gas Company. A small portion of the region is served by a municipal gas utility, Long Beach Energy (part of the City of Long Beach). In 2005, the SCAG region consumed more than half (about 800 billions of cubic feet) of the natural gas consumed in the state excluding electricity generation use. Since 2000, the total non-electric generation use of natural gas in the region has been fluctuating slightly around 800-billion level and is projected to remain relatively constant for the next ten years. As to the per capita consumption of natural gas in the region, it has been on a gradually declining path since 1998 reaching about 45,000 cubic feet in 2005 (Figure 65).

In the region, residential was the largest user (33 percent) of natural gas followed by mining (32 percent). Among the total residential uses of natural gas, water heating and space heating each consumed about 44 percent.

Figure 65

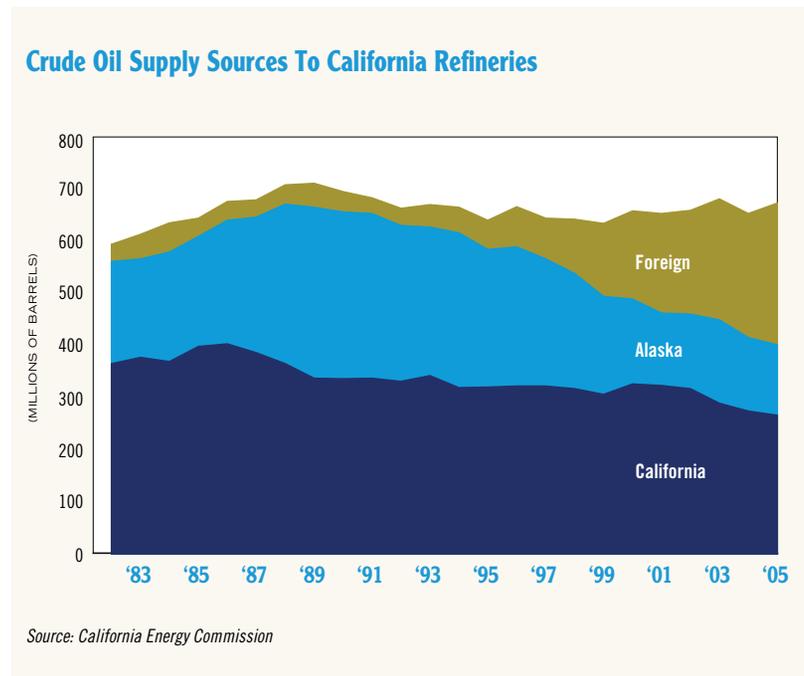


Vehicle Fuel Consumption

In 2005, more than 40 percent of the crude oil to California refineries came from foreign imports, exceeding for the first time the production from California (39.5 percent) (Figure 66). The share of foreign imports has been increasing rapidly from below 10 percent in 1995 to over 40 percent in 2005. During the same period, production from California decreased from 50 percent to

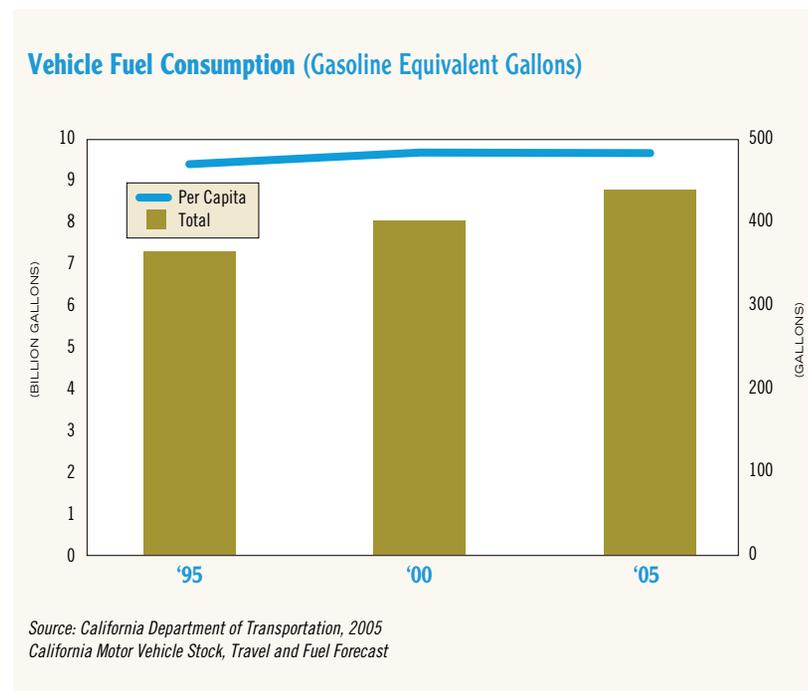
below 40 percent while imports from Alaska also decreased from 41 percent to 20 percent. Nationally, oil imports accounted for about 65 percent of the total consumption. Among the total petroleum use in the state, almost two-thirds were for vehicle fuel consumption including motor gasoline (54 percent) and distillate fuel (11 percent).

Figure 66



In 2005, the region consumed about 8.8 billion gallons of vehicle fuels, an increase over 20 percent from a decade ago (Figure 67). However, per capita vehicle fuel consumption, though increasing slightly between 1995 and 2000, has since been relatively constant at about 485 (gasoline equivalent) gallons.

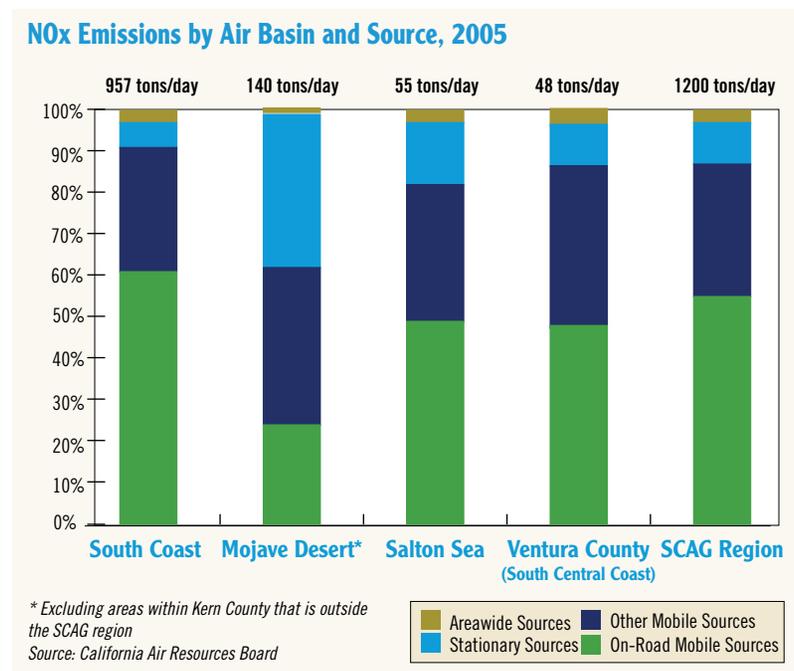
Figure 67

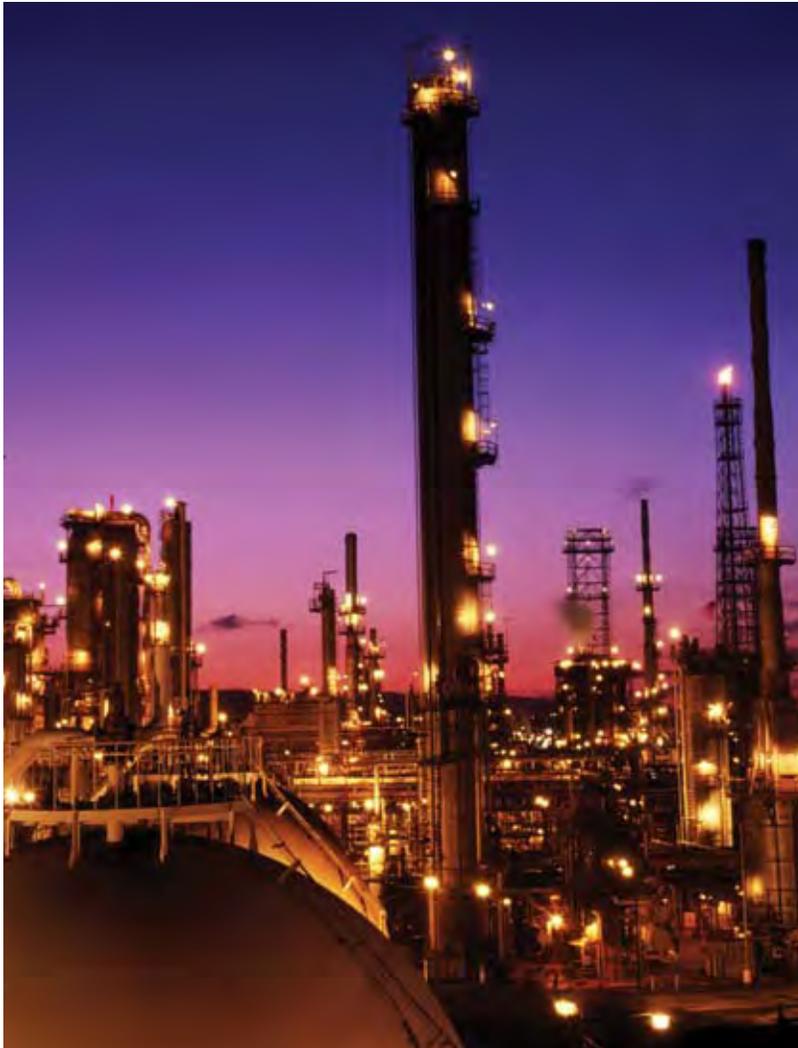


Impacts on Global Warming

The combustion of fossil fuels (petroleum, natural gas and coal) to release their energy creates carbon dioxide (CO₂) emissions, the most significant greenhouse gas that affects global climate change and specifically global warming. This is in addition to fossil fuels' impacts on regional air quality including ozone pollution as described in the Air Quality Section. For example, the burning of fossil fuels for mobile sources in the region is responsible for more than 85 percent of total NO_x emissions, a precursor of ozone pollution (Figure 68).

Figure 68





Climate change is the shift in the “average weather” that a given region experiences. Currently, the Earth is warming faster than any time in the previous 1,000 years and the ten warmest years of the last century all occurred within the last 15 years and the global mean surface temperature has increased by 1.1° F since the 19th century. Human activities are altering the chemical composition of the Earth’s atmosphere through the release and build up of climate change emissions, predominantly CO₂, that absorb the heat. Specifically, the concentration of CO₂ in the atmosphere has risen about 30 percent since the late 1800s, and is estimated to reach between two to three times of its late 1800s level by 2100. Scenarios examined by national and international assessments indicate that temperatures in the U.S. will rise by about 5° to 9° F on average in the next 100 years.

Global warming poses a serious threat to the economic well-being, public health and natural environment in Southern California and beyond. The potential adverse impacts of global warming include, among others, a reduction in the quantity and quality of water supply, a rise in sea levels, damage to marine and other ecosystems, and an increase in the incidences of infectious diseases. Over the past few decades, energy intensity of the national and state economy has been declining due to the shift to a more service-oriented economy. California ranked fifth lowest among the states in CO₂ emissions from fossil fuel consumption per unit of Gross State Product. *However, in terms of total CO₂ emissions, California is second only to Texas in the nation and is the 12th largest source of climate change emissions in the world, exceeding most nations. The SCAG region, with close to half of the state’s population and economic activities, is also a major contributor to the global warming problem.*

In 2000, California generated 473 million metric tons (CO₂ equivalent) emissions, an increase of 11 percent since 1990. It is projected to increase over 600 million metric tons (CO₂ equivalent) emissions in 2020 (Figure 69).

California Governor's Executive Order S-3-05 established statewide climate emission reduction targets as follows:

- By 2010, reduce emissions to 2000 levels;
- By 2020, reduce emissions to 1990 levels;
- By 2050, reduce emissions to 80 percent below 1990 levels.

In addition, state legislation AB 32 - California Global Warming Solutions Act passed into law in 2006 that also required the California Air Resources Board to adopt the statewide greenhouse gas emission limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020.

Among the climate change pollutants resulted from California's economic activities, 81 percent are CO₂ emissions from fossil fuel combustion (Figure 70). In addition, non-fossil fuel sources produced 2.3 percent of the total pollutants mainly due to cement production. Methane (CH₄) accounted for 6.4 percent of the total pollutants generated primarily from landfills, enteric fermentation and manure management. Nitrous Oxide (N₂O) accounted for another 6.8 percent largely due to mobile source combustion and agricultural soil management. Finally, other gases with high global warming potentials (GWP) accounted for the remaining 3.5 percent. These high GWP gases include use of substitutions of other gases (hydrofluorocarbons or HFCs)

for ozone-depleting gases, electricity transmission and distribution (Sulfur Hexafluoride or SF₆), and semiconductor manufacturing (perfluorocarbons or PFCs and SF₆). It should be noted that the percentages of climate change pollutants associated with each gas were generally stable over the 1990 to 2002 period, except that the high global warming potential gas percentage rose somewhat.

Figure 69

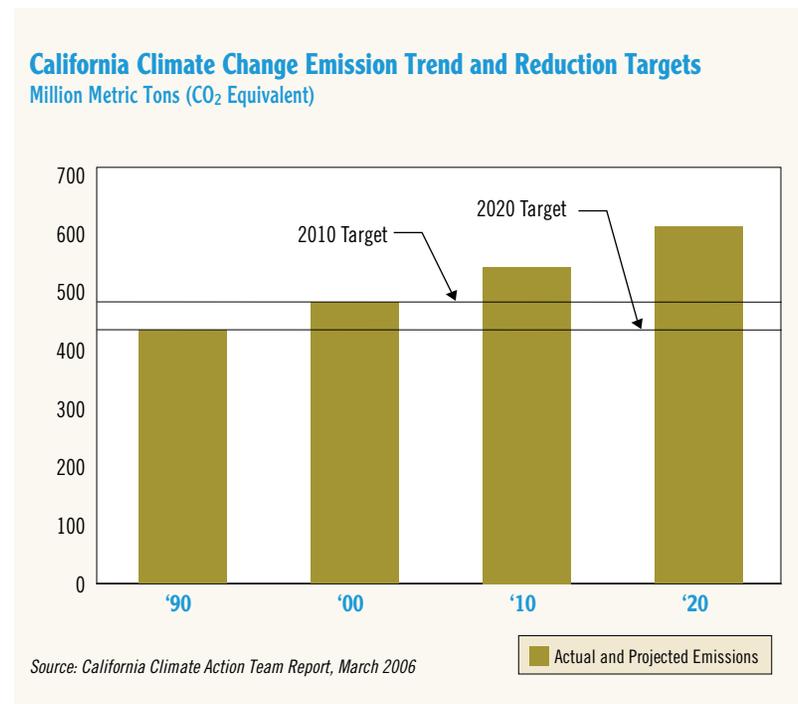
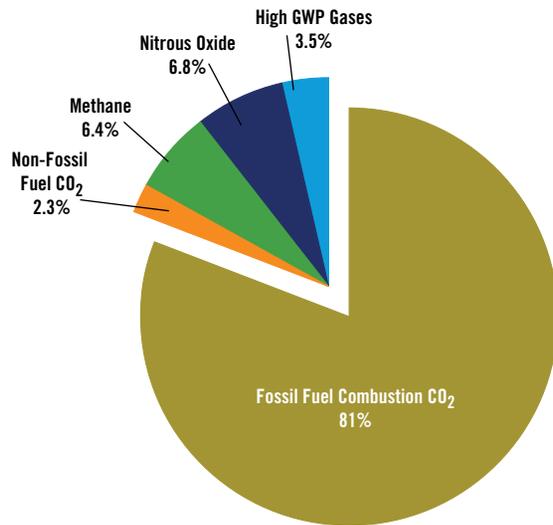


Figure 70

California Composition of Gross Climate Change Pollutants, 2002



*GWP: Global Warming Potential
Source: California Climate Action Team Report, March 2006

Among the different sectors in California, transportation is the largest source (41.2 percent) of climate change emissions followed by the industrial sector (22.8 percent). Electricity production, from both in-state and out-of-state sources, was the third largest source at 19.6 percent. The SCAG region is likely to have the similar pattern as the state.

THE ENERGY DETENSIVE ECONOMY: CHALLENGES AHEAD FOR LOCAL GOVERNMENT

BY RONALD R. COOKE

Introduction

Our local City Council recently held a public policy workshop on community development. After a brief introduction, attendees were divided into groups of 10 to 12 people and given the task of making a list of desirable land use priorities, community amenities, and development styles for our growing City. When we re-assembled, our lists were read to the audience. The results were remarkable. Along with the usual concerns about density, traffic and housing, there emerged a genuine apprehension about the consumption, cost and environmental impact of energy. Attendees believed community leaders are not giving sufficient consideration to energy in the local decision making process.

They are not alone. Energy has become a hot topic all over America. Thus far our lifestyle has assumed the *intensive* use of low cost and readily available energy. But we have now entered the age of the *energy detensive economy* – further economic growth will be interdependent with alternative forms of energy as well as increased energy efficiency and conservation. The focus of daily life will shift to the prudent use of a higher cost commodity.

Energy is becoming a strategic issue for local government. For example, the Portland, Oregon City Council has established a task force to assess the impact of energy resource depletion on 14 topics including Transportation, Land Use, Local Economy, Public Services, and Communication.¹ Denver, Colorado, co-sponsored a Conference on Peak Oil, and has launched Greenprint Denver to promote the importance of sustainable development and ecologically-friendly practices throughout the community. Greenprint policy objectives include energy efficiency in the private sector, increased public transit access and use, transit-oriented development, bike and pedestrian enhancements, energy-efficient affordable housing, and the construction of solar and methane power plants.²

Energy has also become a key issue for environmentalists. Community leaders are being challenged.

Local government can no longer make policy decisions based on the obsolete assumption we will always have abundant quantities of affordable energy.

The Reality of Depletion

One vital reason can be summed in two words – oil depletion.

Much has been written about “Peak Oil”. Many have tried to estimate the date when world oil production will peak and then begin to decline, causing chronic shortages and sharply higher prices. Most projections range from 2005 to 2025. Although the specific date may be speculative, the underlying facts are not. For more than 20 years, we have been using oil faster than we can find it.³ US oil production peaked over 35 years ago. The decline of production is irreversible in 33 of the largest 48 producer nations. New discoveries in 2004 and 2005 were woefully inadequate. Consumption now exceeds new discoveries by more than 2:1. In order to sustain the world economy, exploration and production companies must add at least 350 Bbl (Billion barrels) of oil to the world’s reserves between 2005 and 2024. Despite sharp increases in exploration, and the utilization of the best available technology, few believe we can achieve this goal. At some point in the near term future, the demand for oil will exceed the supply of oil.

That’s a fact.

Furthermore, we need to distinguish between conventional crude oil and non-conventional oil. Conventional crude oil, together with Natural Gas Liquids from the same geologic structures, is typically found under land or shallow water, and constitutes over 90 percent of the oil we have used in the past. Unfortunately, much of the oil we have been using has come from a relatively small number of aging “super” fields. Many are in decline. Going forward, we will have to place greater reliance on non-conventional oil – oil derived from



deep sea resources, tar sands, polar wells, and so on – for an increasing percentage of the oil we use. It will be more expensive to find, produce, and transport this oil to the refinery. Much of it will be more costly to refine.

Political stability in the Middle East, Africa and South America is also a critical element of future oil production. Most of the world's known oil reserves lie within these geographic areas. Unfortunately, although Saudi Arabia has huge reserves of oil, its ability to provide a buffer for world oil stocks is almost gone. Iraq and Iran are embroiled in conflicts that may disrupt oil production, and sporadic conflict is not uncommon in Africa. Thus, even if depletion were not a factor in the oil market equation, the vulnerability and unpredictability of oil production will make it impossible to always balance supply with demand. Price volatility and sporadic shortages are inevitable.



Yes. There is more oil beneath the surface of our planet. But we are in a trap. We have used up most of the easy-to-get low cost oil. Resource nationalism exists. World oil has thus transitioned from a market driven by consumer demand to one limited by producer capacity. As a result, oil exporting countries are now able to control the price and the availability of an increasingly scarce commodity.

What happens when available oil production is no longer able to provide 40% of our total energy and 99% of our mobile fuels? The existing cost, mobility, and energy content of oil can not be duplicated by any known technology or natural resource. That means it is highly likely we will experience the economic and cultural impact of Peak Oil before we reach that magic date.

It's time to face reality.

California Is On A Collision Course

According to the Energy Information Administration (EIA), California is the second largest consumer of energy in the nation. It ranks 4th in both crude oil reserves and crude oil production. California is the largest consumer of gasoline, and 2nd in distillate and jet fuel consumption. California has the third largest refining capacity in the nation.

We have developed our economy, and our lifestyle, on the basic assumption of unrestricted energy consumption.

Unfortunately for Californians, annual crude oil production peaked in 1985 at 394 million barrels. By 2005 in-State oil production had declined by 42 percent. To make up the difference, we Californians increased our oil imports from 50 million barrels in 1994 to more than 250 million barrels in 2005. We now depend on foreign suppliers for more than 42 percent of our oil, and that percentage is growing.

Rapidly.

So what does this all mean? Whether or not your gas station has enough gasoline or diesel fuel to sell depends on two factors:

- the outcome of events now unfolding in Alaska, California, Saudi Arabia, Ecuador, Iraq, and Canada which supply California refineries with most of the oil we process, and
- whether or not California can secure additional oil, gasoline, and diesel supplies from in-State, North American, or foreign resources.

Since there are severe limitations on the development of new in-State or North American oil resources, we Californians – like our counterparts in the other 49 States – will have to *compete* for declining oil resources in a world commodity market characterized by highly volatile prices and the constant threat of sporadic shortages.

So let us summarize where we are.

We Californians are planning to consume increasing quantities of a commodity that may, or may not, be available, at a price that many of us will not be able to afford.

Does this make any sense?

But wait. California's energy challenges go way beyond oil. Consider these excerpts from the California Energy Commission's 2005 Integrated Energy Policy Report:

- "California is the sixth largest economy in the world. To meet the needs of its growing population, California's economy depends upon affordable, reliable, and environmentally sound supplies of electricity, natural gas, and transportation fuels. The challenge for California's policy makers is to manage an energy sector that is increasingly dependent on oil and natural gas and may face spiraling energy prices, potential supply shortages, and an inadequate and aging energy delivery infrastructure."
- "Despite improvements in power plant licensing, enormously successful energy efficiency programs, and continued technological advances, development of new energy supplies is not keeping pace with the state's increasing demand (for electricity)."

- "In the transportation sector, California's refineries cannot keep up with the mounting need for petroleum fuels and consequently depend upon increasing levels of imports to meet the state's needs. California also imports 87 percent of its natural gas supplies, which are increasingly threatened by declining production in most U.S. supply basins and growing demand in neighboring states."
- "As the state's demand for electricity increases, California could face severe shortages in the next few years."⁴

The California Energy Commission's report contains some very chilling commentary. California is definitely on a collision course with an energy crisis. It's our inevitable destiny. We can no longer automatically assume we will have enough affordable energy to fuel our cars and trucks, heat and cool our homes, power our appliances and lights, or refrigerate and cook our food.

Welcome to the realities of the 21st Century. Thus far, we appear to be on a course not unlike the oil *Production Crisis* described in my book.⁵ Periods of surplus alternate with intervals of shortage. Although prices remain volatile, they inevitably increase over time. Shortages and higher prices are recessionary. Unemployment and inflation increase while GDP declines. The opposite trend occurs when there is a surplus of oil (assuming no other contravening problems) because the world economy is able to recover. On the other hand, a scenario similar to the book's *Political Crisis* is also entirely possible. The social chaos of a Political-Security crisis would be immediate and devastating. Fuel shortages and price shocks, added to existing vulnerabilities in our economy, could trigger a depression. Urban families, particularly those whose

income depends on driving great distances each day, will be more affected than rural families. Government reaction will necessarily focus on welfare and social services.⁶

But we need not be entirely pessimistic. We can avoid catastrophic change. Read the report by Robert L. Hirsch et al. for the Department of Energy (DOE)⁷. I present two key points from this excellent effort:

- "Intervention by governments will be required, because the economic and social implications of oil peaking would otherwise be chaotic. The experiences of the 1970s and 1980s offer important guides as to government actions that are desirable and those that are undesirable, but the process will not be easy."
- "Prudent risk management requires the planning and implementation of mitigation well before peaking. Early mitigation will almost certainly be less expensive than delayed mitigation."

Unfortunately, our civic institutions are ill-prepared to deal with the inevitable dislocation of declining energy resources. We continue to make planning decisions that encourage the intensive use of energy. Clogged freeway lanes, deficient public transportation, far distant suburbs, alienated shopping centers, and a frenetic lifestyle are the result. But it is time to face the inevitable. Community leaders and ordinary people must contemplate a basic question: Should we continue to assume a "business as usual energy intensive lifestyle for as long as possible (and thus risk a cataclysmic collapse), or should we take pre-emptive measures designed to ease the transition to an energy detensive society?



Our mechanized civilization has embraced the assumption we will always have unlimited quantities of affordable energy. But California can not drill its way out of the pending energy crisis, it can not isolate itself from world oil and natural gas markets, and it can not depend on technology to solve all of its problems. Yes. We all champion alternative energy solutions. And a few of them – like solar energy - hold great promise. But *none* of the proposed alternative energy solutions will provide sufficient energy to provide more than a fraction of the fuels and electricity we will need to sustain our *current* lifestyle.

That means our lifestyle has to change! Along with essential elements of our culture.

And that brings us to the real focus of this essay: what can local government do to help us through our pending energy crisis? What is the role and responsibility of municipal, county, and Regional political structures? Is local government obliged to develop a pro-active strategic community plan to manage the challenges that lie ahead?

Yes. And the sooner, the better.

The Role of Local Government

An energy crisis will create significant challenges for local government. As we switch from cheap oil and natural gas to alternative energy resources, people within the SCAG region will soon discover there is insufficient energy to sustain their current lifestyle. If natural gas and propane become sufficiently

expensive - or unavailable - some will switch to wood and coal to heat their homes and cook their food. Increasing rates of inflation and unemployment will stress the welfare system. Constituents are not going to be happy about the loss of personal mobility, chronic shortages, insidious inflation, or declining employment opportunity. Expect a larger percentage of the population to fall below the poverty line. The declining availability of personal transportation, coupled with economic constraints, ensures that access to adequate health care will deteriorate. People will expect government to do more than it is logistically or financially capable of doing. Frustration will lead to a decreased commitment to diversity, social conflict on the streets and increased rates of crime.

So. What can local government do? We can moderate these risks. We can assume an energy detensive economy will drive social change, increasing the demand for social, medical, and community services. We must be willing to innovate a new model for the management and delivery of these services.

First. Community leaders and local government staff must become thoroughly familiar with the energy issues that confront us. No sugar coating. No promises we can not keep. In particular, we must be sure we understand the ramifications of oil depletion because they underlie the inevitable conflict over personal mobility, how we heat our homes, and pay our bills. Attend lectures, conduct discussion groups, read books and browse the Internet for information. Make sure everyone participates. Ignorance makes poor decisions.

Second. One of the most important jobs of local government will be communication. Lectures, conferences, books, visual media and printed materials must be available. The local library system must become a focal point of lo-

cal communication. Again. Tell the truth. Many constituents will not understand the cause of their dislocation. Hence, one can expect opposition to government's response if it is not well explained.

Third. Evaluate local government's response. SCAG's Regional Comprehensive Plan, and Local Government General Plans, can play an important role in initiating projects and programs, removing obstacles to energy conservation and efficiency initiatives, creating incentives for shared and public transportation, managing transportation pools, establishing self-sufficient neighborhoods, and fostering an environment of cooperation, experimentation, and urgency. Make sure both plans reflect the new energy reality. Every item must be examined. Does it assume unlimited quantities of cheap energy? If so, change it. Focus on the local economy. Make sure each planning decision will support the community in an energy detensive environment. Assume constituents will have to make lifestyle changes. Understand that Local and Regional government planning challenges and concerns will be substantially altered by trends in the availability and price of oil and natural gas. Issues of interest in 2006 will be supplanted by a wide range of new land use, service, and transportation demands by 2016. Re-evaluate land use policies. Key issues include: urban growth boundaries, integrated communities, residential density, localization of shopping, senior care and medical facilities, affordable housing, and personal versus public transportation options.

Fourth. Local community organizations will need to step up and assume responsibility for many social and logistical services. Our culture has made a huge mistake. We have replaced much of the work that used to be done by local

charity organizations with officious government programs. We must reverse this process. Make sure civic groups, fraternal organizations, and religious institutions become part of the solution by tasking them to fund, staff and execute specific responsibilities. Encourage volunteer groups who agree to provide support to the infirm and elderly, educate and assist home owners with energy efficiency improvements, manage ride sharing and home delivery networks, develop community gardens, and so on. Don't get in the way. Avoid well-meaning regulations that discourage localization initiatives or the creation of neighborhood communities. Residents within the SCAG area can, and should, make a positive contribution to the needs of their own neighborhood community.

Fifth. Create a strategic plan to identify, develop, and initiate appropriate responses to the energy challenges that lie ahead. Organize the plan around



specific desirable outcomes. Set five, ten and 15 year objectives. Assign responsibilities. Recognize government will not be able to do everything that needs to be done. Create a dialogue among neighbors for their mutual support. Neighborhood Communities must learn self sufficiency.

Sixth. Be sure there is a group within the SCAG organization that has the authority, mission and responsibility to drive the implementation of the strategic plan you create.

Yes. We know the world is changing. We must change the way we see the world.

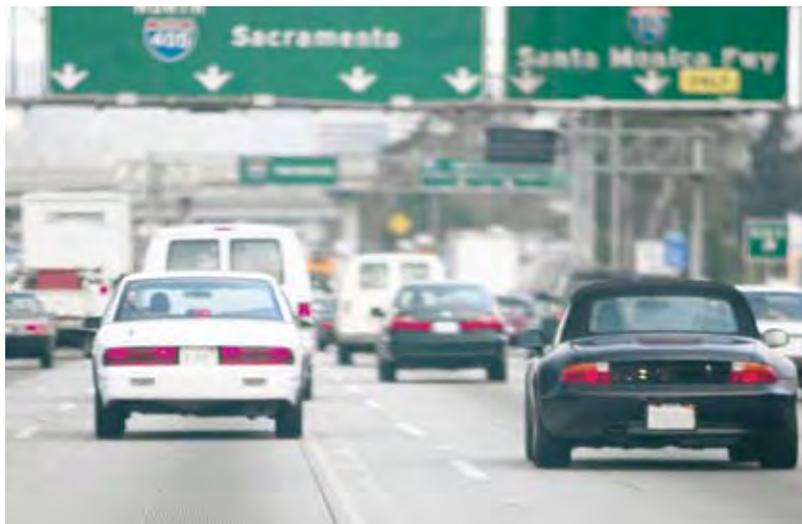
Actionable Response

SCAG and Local Governments can prepare for the inevitable energy challenges that lie ahead. Here are three key concepts.

The Neighborhood Community

We have developed a culture around the assumption that large institutions operate as highly centralized organizations. Implicit in this concept is the use of vehicles to move people and things between a centralized core facility and a remote point of need. We must rethink our assumptions about community organization. We must replace the existing neighborhood model, which is often merely a collection of unrelated people who seldom talk with each other, with a working community of neighbors who work together to create a better life for themselves. The Neighborhood Community must become the focal point for local government operations. Although most urban areas already

have nascent Neighborhood Communities, suburban and rural parts of the SCAG region will need to develop these centers from scratch. Establish multi-use centers for every identified neighborhood. Here one can find a transportation center, local retail stores, personal and financial services, emergency and in-home medical facilities, child care for working moms, support programs for teens and seniors, library and communication services, and local government representation. People must be encouraged to take care of themselves within a group activity environment. Individuals become stakeholders with an interest in the outcome of daily operations. Encourage local groups to play a greater role in the provision of neighborhood services and support. For individual participants, the Neighborhood Community provides a frame of



reference, serves as a surrogate extended family, reinforces peer group social values, and conveys a sense of emotional security.

Transportation

When I was a kid, I could walk or ride a bicycle to almost everything I needed – the market, clothing store, barber shop, movies, school, bus station, and so on. Relocalization into Neighborhood Communities will encourage walking and bicycling. Accelerating fuel prices, will encourage a shift from personal vehicles to carpooling and public transportation. This suggests Governments must refocus their transportation capital expenditures from personal vehicles to public transportation systems, and the support of multi-occupant carpooling programs. It's time to get serious about *interconnected* light rail, railroad, local shuttle, express and mini-bus services. Let local entrepreneurs experiment with ride sharing options to complement the fixed route public transportation system.

If we do not have a debilitating oil shortage that will *force* dramatic changes in how we use transportation, and if we are willing to accept the transformation depletion will impose of our collective lifestyles, then the goals set forth in the following Exhibit are entirely realistic. By the end of 2011, people within the SCAG region would essentially return to the transportation profile they had in 2000. By 2016, driving alone would be reduced by 30 percent. Every Neighborhood Community must have its own public transportation center for transit stops and the coordination of local carpooling programs.

Exhibit 1

SCAG Region Transportation Modes (How Do We Get To Work?)

	2005	2011	Change vs. 2005	2016	Change vs. 2011	Change vs. 2005
Carpooling*	11.4%	14.3%	25.4%	18.0%	25.9%	57.9%
Public Transit **	4.5%	6.0%	33.3%	10.5%	75.0%	133.3%
Walked	1.9%	2.5%	31.6%	3.6%	44.0%	89.5%
Work at Home	4.2%	7.0%	66.7%	12.0%	71.4%	185.7%
Drive Alone	76.7%	68.5%	-10.7%	53.9%	-21.3%	-29.7%
Other Means	1.3%	1.7%	30.8%	2.0%	17.6%	53.8%
TOTAL	100.0%	100.0%		100.0%		

* Carpooling is 2 or more persons per vehicle.

** Excludes Taxi Cab, includes minibus in 2016

Data excludes persons living in an institution, military base, or dormitory.

The upside of meeting these goals is that people within the SCAG region would reduce their fuel demand by more than 2.5 million gallons per day, and vehicle emissions by 20 to 25%. Traffic congestion would sharply decrease. The downside has to do with lifestyle: greater use of public transportation and carpooling means we better plan to live closer to where we work.

Land Use, Zoning and Building Codes

Local governments must review their land use, zoning and building codes with one specific question in mind: does each code optimize the consumption of our energy resources? Energy intensive development must be replaced by energy *detensive* projects. It makes no sense to permit the development of *any* project that assumes the unrestricted use of affordable motor fuels. Zoning codes must focus on ending urban sprawl, the creation of Neighborhood Communities, encouraging mixed use projects, permitting home and community based businesses, altering road specifications to accommodate bicycles and pedestrians, and the generation of electricity from renewable resources. And we can no longer turn our noses up at the thought of converting sewage into fertilizer, re-using grey water for landscaping, or the creation of open spaces for community and private gardens. Property owners must be encouraged to participate in energy rating programs in order to reduce their consumption of electricity and fuels for heating and air conditioning. Remove the barriers to the use of new materials and construction techniques. Require all new construction to meet energy *detensive* guidelines.

For every planning decision, we must answer two simple questions. Where will we get the mobile, stationary, and heating fuels to sustain the proposed development? How do mass transit systems, electric power distribution, “green” building codes, and other energy considerations figure into the decision process? Our planning process, guidelines, and objectives must reflect the new reality of an energy *detensive* world.

There is much to be done.

Conclusion

We are a voracious consumer of energy. We have developed an energy *intensive* economy and lifestyle. Our culture assumes energy will always be inexpensive and readily available. Our values, laws, regulations, social customs, ambitions, and social progress have been inexorably linked the ever-increasing consumption of coal, oil and natural gas. Material abundance and population growth mirror energy consumption. The freedom of personal mobility is ingrained into our psyche. These things, we believe, are a natural right.

They are not.

We are being challenged. We are challenged to change the way we think of energy. We will **not** be able to replace all of the oil and natural gas we use with alternative fuels. We will **not** have a “business as usual” future. We **do** have to change our economic system and social structure in order to deal with the realities of an energy constrained world. And we **will** transition to a more sustainable lifestyle.

Southern California is vulnerable to an energy shortage. A long term, forever, chronic, downtrend in energy consumption because it is no longer affordable or readily available is coming. We are going to learn to live in an energy *detensive* world. Our energy intensive lifestyle will give way to a daily routine that consumes *less hydrocarbon energy*.

Detensive. This word describes our energy future.

By the time you read this essay, the price of gasoline may be less than \$2.50 a gallon, or it may be more than \$4.00 a gallon. Short term fluctuations in price are to be expected. Although we can make the case that “Peak Oil” will not occur until after 2020, a dispassionate analysis of world events suggest it will happen much sooner. No matter what the timing, common sense dictates we must prepare for the inevitable. Local government can make a positive contribution to the successful creation of localized, self-sustaining, neighborhood communities; interconnected public transportation systems, and the development of an energy efficient infrastructure. Community leaders must be willing to challenge conventional wisdom with pro-active adaptation and practical flexibility. Existing assumptions, policies, codes and regulations may not be appropriate in an energy *detensive* world. We must be willing to re-view our infrastructure investment decisions within the context of an energy *detensive* environment and a genuine desire to work toward energy independence. Localization requires we pay attention to addressing a better balance between local jobs and housing. And finally - we must pro-actively include civic, fraternal, and religious organizations in our long term planning for community services.

The sooner we start the review process, the greater our potential success.

Ronald R. Cooke

The Cultural Economist



Endnotes

¹Portland's 93-page briefing book may be found at www.sustainableportland.org, or by doing an Internet search on "Peak Oil Task Force Briefing Book".

²Details on Denver's Greenprint agenda can be found at <http://www.greenprintdenver.org>

³We have also been using natural gas faster than we can find it since 1991.

⁴The full text of the California Energy Commission's 2005 Integrated Energy Policy Report is available on the Internet.

⁵If you want a better understanding of oil depletion and peak oil, most of the information you need can be found on the Internet. Start with my Blog at www.tce.name. Read my essays found in "Energy" and "Federal Energy Policy", browse through "The Oil Depletion Report", and then cruise through the WEB sites listed in the "Links Worth Exploring" sidebar of the Energy Blog. It's all free and most of the people who sponsor these sites are honest, thoughtful, straight-up individuals who happen to have a genuine concern about the future of the human race.

⁶On July 19, 2006, Federal Reserve Chairman Ben Bernanke commented that economic moderation "seems underway". Although high oil prices were a concern, and despite the fact the core rate of inflation had risen at an annual rate of 3.6 percent over the prior 3 months, future increases should be moderated by declining economic activity. Real GDP was projected to grow at a rate of 3.25 to 3.5 percent for 2006. Unemployment would be in the range of 4.8 to 5 percent. The Federal Reserve's projections, of course, assume the oil market will not be disrupted by a production or political crisis. That assumption will be critically tested before the end of 2007.

⁷*Peaking of World Oil Production: Impacts, Mitigation, and Risk Management*, published by the U.S. Department of Energy, National Energy Technology Laboratory, February 2005; Robert L. Hirsch, SAIC, Project Leader, Roger Bezdek, MISI, and Robert Wendling, MISI.

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Vision

Progress

Leadership, vision and progress which promote economic growth, personal well-being, and livable communities for all Southern Californians.

The Association will accomplish this Mission by:

- Developing long-range regional plans and strategies that provide for efficient movement of people, goods and information; enhance economic growth and international trade; and improve the environment and quality of life.
- Providing quality information services and analysis for the region.
- Using an inclusive decision-making process that resolves conflicts and encourages trust.
- Creating an educational and work environment that cultivates creativity, initiative, and opportunity.

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