Energy

THE CHALLENGE

Clean, stable and sustainable sources of energy for Southern California are critical to supporting a healthy and resilient region. In developing future plans, SCAG must fully weigh and consider energy supply, efficiency, consumption, and environmental impacts such as greenhouse gas emissions. California relies on petroleum-based fuels for 96 percent of its transportation needs.[1] The SCAG region consumes over 23 million gallons of gasoline and diesel per day; roughly half of California's oil consumption[2] and vehicle fuel consumption in the region has increased 20 percent over the last ten years.[3] Furthermore, only 14 percent of the electricity consumed in the region is generated from renewable sources.[4] At the same time, SCAG forecasts significant growth in population, households, and jobs that will place new demands on energy production and increase pollution and greenhouse gases.

We live in an energy-constrained world. Both environmental and geopolitical factors call into question the long term viability of a fossil fuel-based energy future. Concerns about global climate change have motivated action to move away from fossil fuels, while continued oil price fluctuations and supply constraints have helped raise awareness about the unsustainability of our dependence on imported petroleum.

The U.S. represents 5 percent of the world's population, but consumes 25 percent of the world's oil.[5] In addition, the U.S. Department of Energy forecasts that world liquid fuels consumption is projected to increase by 35 percent from 2005 to 2030 and that U.S. consumption of liquid fuels is projected to increase by 10 percent between 2005 and 2030, from 21 million barrels per day to 23 million barrels per day.[6*] The lower projected level of consumption reflects the influence of the new corporate average fuel economy (CAFE) standard for light-duty vehicles specified in the Energy Independence and Security Act of 2007 and slower economic growth, as well as the impact of higher fuel prices.[7]

The U.S. currently imports 58 percent of its petroleum and California imports approximately 45 percent of its petroleum. In California, oil production peaked in 1985. Since then, the share of oil from foreign imports has increased rapidly, from below 10 percent in 1995 to 45 percent in 2007, as shown in **Figure 5.1**.[8] In 2007, California received 25 percent of its foreign oil imports from Saudi Arabia, 19 percent from Ecuador, and 20 percent from Iraq.[9] Globally, increasing demand from the large growth in the economies of India and China will further tighten world oil supplies. According to the U.S. Energy Information Agency, India has become the fifth larg-

HOW ENERGY POLICIES PRODUCE MULTIPLE BENEFITS

Land Use and Housing: Decreasing the region's reliance on fossil fuels will reduce the need to build or expand refinery and delivery infrastructure, thereby reducing siting pressures and potential land use conflict with residential or other incompatible land uses.

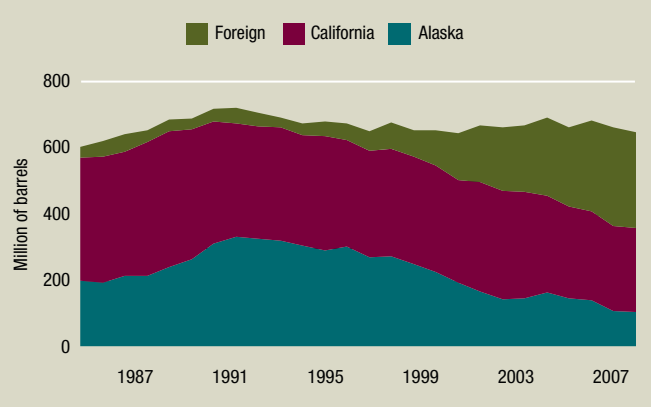
Open Space and Habitat: Energy policies encouraging mixed-use development with pedestrian corridors and bike trails can reduce fuel consumption, improve air quality, and promote an active lifestyle.

Water: In California, water related energy use consumes about 19% of the state's electricity, 30% of its natural gas, and 88 billion gallons of diesel fuel every year; and this demand is growing.

Air Quality: Energy policies that reduce our dependence on petroleum will benefit air quality. Electric vehicles produce only 6 percent of the air pollution generated by the cleanest on gas-powered cars.

Concerns about global climate change have motivated

FIGURE 5.1
Oil Supply Sources in California



Source: California Energy Commission

est consumer of oil in the world during 2006.[10] China is the world's most populous country and the second largest energy consumer behind the United States.[11]

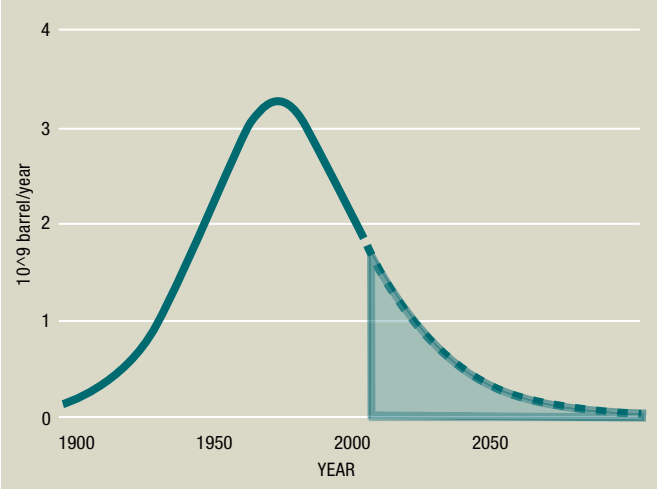
There are additional concerns that the nation's dependence on oil, especially from the Persian Gulf, requires a U.S. military presence, with all of its associated economic and social costs.[12] Oil production could be shut down by wars, strikes, and other political events in many countries with proven oil reserves. For example, the countries of Iran, Iraq, Nigeria and Venezuela contain one-third of worldwide reserves but face high levels of political risk. Additionally, countries defined as having medium to high levels of political risk held 63 percent of proven worldwide oil reserves.[13]

Furthermore, much of the oil remaining in the ground can only be accessed by using complex and costly technologies that present greater environmental challenges than technologies used to recover most of the oil produced to date. Enhanced oil recovery technologies are much costlier than conventional production methods and increase greenhouse gas emissions due to the additional energy required to perform the tasks.

Oil is a finite and non-renewable resource and it is uncertain how future energy consumption trends will be sustained with the current political, environmental and technological constraints. Our nation's reliance on petroleum for our energy needs is even more problematic because of the global trend toward an inevitable turning point–"peak oil"–the peak and then decline of global oil production. Peak oil is the point of maximum oil production whether from a single well, a country, or the planet as a whole. The maximum point of production is expected to happen when about half or slightly more of the ultimately recoverable oil has been produced. To be clear, peaking does not mean "running out." Rather, it indicates the point where global production can no longer be maintained or increased. Production will begin to decline, year after year. Geophysicist M. King Hubbert correctly predicted the 1971 peak in U.S. oil production as shown in **Figure 5.2** and further predicted that sometime between 2005 and 2025, world oil production will reach a peak and begin a sharp decline.[14] Figure 5.2 also illustrates that the U.S. is currently consuming the remaining 25 percent of our known domestic oil reserves, as indicated by the shaded area.

FIGURE 5.2

U.S. Crude Oil Production Projection



Source: Energy Information Administration, Department of Energy and Architecture 2030

A fundamental problem in predicting oil peaking is the poor quality of and possible political biases in world oil reserves data. The recent range of estimates varies from late 2005 to a belief that it will never happen. For example, the International Energy Agency reported in July 2007 that the world will face an oil supply "crunch" in the next five years.[15] Most estimates are based on different geological assumptions and investments in expanded oil production. This wide range of peak oil forecasts presents a very difficult dilemma for policy makers. On one hand, action could be delayed until there is a consensus from scientists; however that is unlikely given the strongly held divergent views. On the other hand, waiting to take action could prove costly and result in severe consequences.

Initiating a move toward conservation, efficiency, demand reduction and renewables 20 years before peaking would offer the possibility of avoiding a world liquid fuels shortfall and significant economic hardship.[16] The world supply crunch will impact the SCAG region. A fuel shortage will take a toll on California's economy as consumers spend more of their household income on gasoline, particularly with development patterns that create long commutes without access to public transportation. High fuel prices also reduce profit margins for the manufacturing and industrial sectors, which pass the higher cost of their goods and services to consumers. Since September of 2004, the monthly average price of gasoline has increased by more than 35 cents per gallon, costing consumers an additional $6.1 billion for gasoline. In addition, during the summer of 2008, California experienced gasoline prices from $3.50 to $4.50 a gallon.[17]

There is also a tightening of natural gas markets due to decreasing supplies and growing demand for natural gas, which makes up 25 percent of the nation's energy use and is a relatively clean source of electricity compared to sources such as coal. The U.S. and California will lose a major source of natural gas imports by 2010 due to the decline of Canada's largest producing basin, the Western Sedimentary Basin, coupled with an approximately 2 percent projected average annual growth in Canada's domestic consumption.[18] Although some research has shown a world peak in natural gas occurring a decade after oil, the U.S. and California could experience the effects sooner. For example, natural gas has become the preferred source of

HOW ENERGY POLICIES PRODUCE MULTIPLE BENEFITS

Solid Waste: Energy policies that promote renewable energy generation have the ability to increase the use of waste materials, such as biomass, for energy production.

Transportation: As our region becomes more energy-efficient, the transportation impacts of accommodating a growing energy infrastructure are reduced.

Security and Emergency Preparedness: Energy policies that reduce petroleum consumption could reduce our vulnerability to external disruptions and geopolitical instability.

Economy: A study found that a 35 mpg vehicle fleet would create as many as 170,800 jobs in 2020 including 22,300 in the auto industry and save consumers nearly $25 billion on gasoline with average prices at $2.55 per gallon. The increase in fuel efficiency would also decrease the demand for oil in the U.S. by close to 2.5 million barrels of oil per day.

Continued oil price fluctuations have raised awareness

electricity generation, supplying over 40 percent of California's power.[19] Also, unlike oil, it is more difficult and expensive to import replacement natural gas from overseas – as it has to be liquefied for transport and then re-gasified for distribution.[20] An increase in natural gas prices would negatively affect the economy, potentially leading to reduced sales and employment.[21]

In addition to the uncertainty regarding fossil fuels supplies, there is also uncertainty about how climate change will alter economies and ecosystems at the global, regional and local levels. Transportation is the largest single source of greenhouse gas emissions in California (38 percent). In 2004, California produced 469 million gross metric tons of carbon dioxide-equivalent GHG emissions, including imported electricity and excluding combustion of international fuels and carbon sinks or storage.[22] Climate change poses serious risks to our economy, water supply, biodiversity, and public health.

These potentially catastrophic impacts have led to new local and state efforts to reduce the amount of greenhouse gas emissions released into the atmosphere. AB 32, or the Global Warming Solutions Act, requires reducing the state's greenhouse gas (GHG) emissions to 1990 levels by 2020, equal to a 25 percent reduction from current levels. Longer term targets have also been set through Executive Order S-3-05, which calls for reducing GHG emissions to 80 percent below 1990 levels by 2050.

The demand for oil must decline at a similar rate to production in order to avert the economic and social consequences of increased prices. If oil and gas become scarce and expensive, it will have profound implications for our economy and way of life.[23] A recent study funded by the U.S. Department of Energy determined that viable mitigation options exist but must be initiated more than a decade in advance to avoid severe economic disruptions.[24]

THE PLAN

The RCP lays out a strategy to reverse the current trends and diversify our energy supplies to create clean, stable, and sustainable sources of energy that address energy uncertainty and environmental health. This plan includes strategies that the region can take to reduce fossil fuel consumption and increase the use of clean, renewable technologies. SCAG will continue to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their implementation. However, leadership is needed to coordinate and provide an ongoing forum for local and regional programs to implement an energy savings program.

As stated in the *2006 State of the Region's* special energy essay, we can prepare for these inevitable energy challenges by encouraging community participation, reinvesting in public transportation, and revising land use, zoning and building codes to optimize the consumption of our energy resources. There are numerous strategies that the public sector can undertake to

address our energy challenges. These make up the bulk of the proposed Action Plan to promote a more sustainable energy supply.

Land Use and Building Design

Steps to reduce energy consumption are necessary both where development occurs and how it is designed. Land use patterns have shaped energy use by increasing the amount of travel necessary to reach jobs and services. This growth pattern has resulted in an increase in vehicle miles traveled (VMT) at a rate of more than 3 percent a year between 1975 and 2004.[25] Building design and housing types also have a strong relationship to energy use and are thus, a strong focus of this chapter. For example, residents of single family detached housing have been found to consume 22 percent more energy than those of multifamily housing and 9 percent more than those of single-family attached housing.[26] SCAG has proactively commissioned research to advance the understanding of effective strategies to reduce energy use, with an emphasis on land use. A summary of the findings follows.

Mixed land use (i.e., residential developments near work places, restaurants, and shopping centers) with access to public transportation has been shown to save consumers up to 512 gallons of gasoline per year. It is estimated that households in transit-oriented developments drive 45 percent less than residents in auto-dependent neighborhoods.[27] With this reduction, there is less overall energy consumption and less greenhouse gas emissions from personal vehicles. Going hand-in-hand with mixed-use development is the development of pedestrian corridors and bike trails that connect residents to work sites, shops, and recreational opportunities, which can also realize a reduction of personal vehicle use and fuel consumption.

Neighborhood energy systems allow communities to generate their own electricity and offer potential advantages such as cost reductions and energy savings up to 40 percent. Micro-grids are a subset of community-based distributed generation (DG) or combined heating and power (CHP) systems that focus on power quality and reliability. Micro-grids are used in communities (often industrial parks) that require higher electric reliability and higher power quality than can be provided by the electric utility. Rather than invest in systems for individual buildings or businesses, the community pools resources and shares the benefits of the community-based system. Generally, micro-grids include DG and power conditioning, but may also include energy storage, CHP, and/or renewables.

Orienting streets and buildings for best solar access can significantly reduce energy requirements throughout the life of a building. Streets should be designed to take advantage of passive solar heating and most buildings should be oriented such that the long axis runs east/west. The southern most face of the building should face within 30 degrees of south (See **Figure 5.3**). Also, strategically planting trees on a residential property can reduce attic temperatures up to 20 degrees Fahrenheit and wall temperatures up to 15 degrees Fahrenheit

HOW ENERGY POLICIES PRODUCE MULTIPLE BENEFITS

Public Health: A South Coast AQMD study found that diesel-based particulate emissions from trucks, ships, and locomotives account for over 80 percent of the toxic air pollution risk in Southern California.

Environmental Justice: Refineries that produce diesel and gasoline fuel from crude oil are often located in low income and minority neighborhoods. Shifting from petroleum-based energy to renewable sources can reduce the need to build or expand energy facilities.

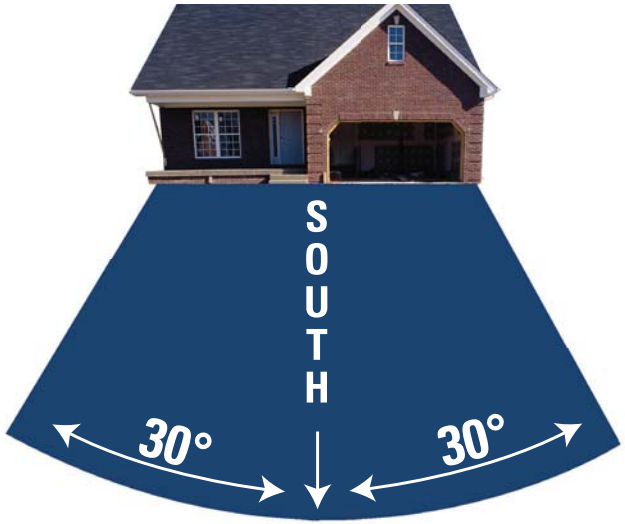
Climate Change: Reducing energy consumption will substantially reduce greenhouse gas emissions. Improving energy efficiency and using renewable energy sources can slow the rate at which we need to build power plants, which are major point sources of greenhouse gases.

The region must become more energy efficient through

on a sunny summer day as well as reduce air conditioning costs up to 20 percent. Trees absorb numerous pollutants (dust, ash, pollen, smoke), remove carbon from carbon dioxide (CO_2) and release oxygen. They also trap and hold up to 50 gallons of water (each) reducing storm water runoff, increasing water filtration in the ground, reducing soil erosion, and requiring minimal watering when mature. Total present value benefits, including energy, environmental and aesthetics are estimated at $1,399,776,270 or roughly $699.89 per tree.[28]

Green buildings can significantly reduce local environmental impacts, regional air pollutant emissions and global greenhouse gas emissions. Green building standards involve everything from energy efficiency, use of renewable resources and reduced waste generation and water usage. For example, water-related energy use consumes 19 percent of the state's electricity. Furthermore, the residential sector accounts for 48 percent of both the electricity and natural gas consumption associated with urban water use.[29] While interest in green buildings has been growing for some time, cost has been a main consideration as it may cost more up-front to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for over-sized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means.

FIGURE 5.3
Orienting Buildings for Best Solar Access



A comprehensive and persuasive study of the value of green building savings is the 2003 report to California's Sustainable Building Task Force. In the words of the report:

> "While the environmental and human health benefits of green building have been widely recognized, this comprehensive report confirms that minimal increases in up-front costs of about 2 percent to support green design would, on average, result in life cycle savings of 20 percent of total construction costs – more than ten times the initial investment. For example, an initial up-front investment of up to $100,000 to incorporate green building features into a $5

million project would result in a savings of $1 million in today's dollars over the life of the building."[30]

On July 17, 2008, the California Building Standards Commission adopted a green building code to promote energy and resource efficient building practices throughout the state. The standards cover commercial and residential construction in the public and private sectors as well as schools of all levels, hospitals and other public institutions. The thresholds include a 50 percent increase in landscape water conservation and a 15 percent reduction in energy use compared to current standards. All the measures, if acted upon, would be at least comparable to the requirements of a Silver rating under the Leadership in Energy and Environmental Design (LEED) standards set by the U.S. Green Building Council.

Alternative Fuels

Alternatives to petroleum and the fueling infrastructure network will be needed for the SCAG region to achieve the ambitious performance outcome of reducing fossil fuel use 25 percent below 1990 levels by 2020. California's leadership on research and development of alternative transportation fuels will help the SCAG region meet these goals. For example, Assembly Bill 1007 provides a comprehensive framework to examine broad transportation fuel issues and effectively integrate transportation energy and air quality policies. The California Energy Commission (CEC) and California Air Resources Board (ARB) also are analyzing numerous options to reduce the use of conventional transportation, which will assist the SCAG region as it grapples with our transportation energy future.

Each alternative fuel has costs, benefits and performance characteristics that will define its effectiveness as a replacement for petroleum. The CEC's 2005 Integrated Energy Policy Report offers a glimpse into the challenges ahead for replacing fossil fuels with alternatives. For example, an increase in the amount of ethanol in gasoline would result in a loss of fuel economy and require motorists to purchase more gasoline since E-85 contains almost 30 percent less energy than gasoline.[32] In addition, the state's Alternative Fuels Plan lays out a vision for 2050, calling for 40 percent of transportation fuels coming from electricity or hydrogen and 30 percent coming from other alternative fuel sources. These energy challenges will force the region to become more energy efficient through technology enhancements, pricing mechanisms, and integrating land use and transportation decisions.

Renewable Energy

Additional efforts will be needed to reach SCAG's performance outcome of 20 percent renewable energy supply by 2010 and its longer term goal of 30 percent by 2020.[33] Of the electricity consumed in the SCAG region in 2006, an average of 14 percent was generated from eligible renewables. By comparison, 12 percent of the electricity produced in California was

Leadership is needed to address our energy challenges

ELECTRICITY AND TRANSPORTATION

The use of electricity as a transportation fuel for transit, automobiles and goods movement reduces air emissions. ARB has estimated that electric vehicles produce only about 6 percent of the air pollution of the cleanest new internal combustion cars available today. The number of electric transportation and goods movement technologies is expected to triple by 2020 to between 900,000 and 1 million units due to known regulatory requirements and financial incentive programs that encourage the use of electric technologies because of their inherent emissions benefits.[31]

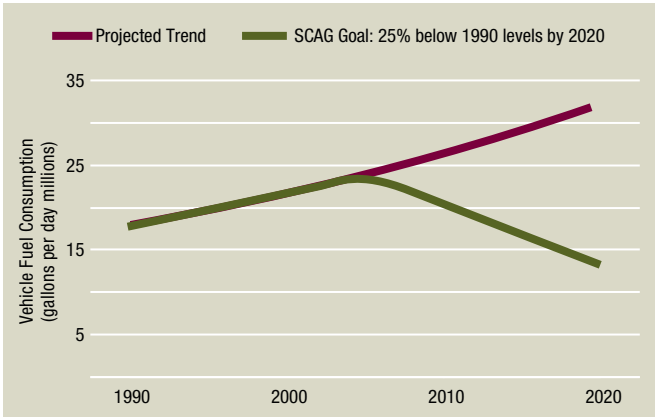
renewable.[34] The CEC recommends various opportunities to expand the renewable energy mix such as adopting clear and consistent policies for sustainable biomass development, taking advantage of California's abundant solar energy resources, and tapping into distributed generation and combined heat and power facilities. California has the potential to produce ethanol from cellulosic biomass material such as municipal, agricultural, and forestry wastes. Solar offers clean, renewable and reliable energy sources. The California Solar Initiative offers incentives and funding for solar installations in an effort to create 3,000 megawatts of new solar-produced electricity by 2017. Distributed generation also offers an alternative to central station fossil-fueled generation since it is produced on site and connected to a utility's distribution system. The most efficient and cost-effective form of distributed generation is cogeneration, or combined heat and power, which recycles waste heat. These technologies will help customers become energy independent and protect them from supply outages and brownouts.

Public Transportation

According to the *2007 State of the Region*, total transit boardings in the region in fiscal year 2006 increased by 44 million (6 percent) since 1990 to a record high of 737 million. Nationally, transit boardings also increased at a faster rate than the population. This shift is good news since increases in public transit ridership can proportionately reduce VMT, congestion, and fuel consumption and improve air quality. A recent study on public transportation found that current public transit use reduces U.S. gasoline consumption by 1.4 billion gallons each year. In a "growth scenario," the study assumed that ridership would double over current levels due to expanded transit systems, new routes, and improved land use patterns. It concluded that the total national fuel savings from public transportation would double from current savings and would equal 2.8 billion gallons per year.[35] SCAG has the opportunity to work with its partners, including transportation commissions, to increase funding of public transportation in the Regional Transportation Plan (RTP), which integrates the transportation plans of all of the cities and counties within the region. By prioritizing funding priorities for energy effi-

FIGURE 5.4

SCAG Vehicle Fuel Consumption: Reversing the Trends



Source: California Department of Transportation and SCAG

cient transportation projects, the region can begin to reduce petroleum demand and improve air quality.

Reversing the Trend

Leadership is needed to coordinate and provide an ongoing forum for local and regional programs that address our energy challenges, reverse our unsustainable dependence on fossil fuels, and increase the use of clean, renewable technologies. As shown in **Figure 5.4**, the goals set forth in this plan are dramatic. However, SCAG can help the region reverse the trend of fossil fuel consumption by continuing to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their realization. The remainder of this chapter will identify how to reverse the current trends and become less dependent on fossil fuels.

ENERGY GOALS

- Reduce our region's consumption of non-renewable energy by:
  - Supplying the energy needs of the region today in a way that reduces the negative environmental impacts, social inequities, and economic hardship on future generations;
  - Developing the infrastructure and social capital to adapt to a future energy economy with a constrained supply.
- Increase the share of renewable energy in the region by:
  - Ensuring the resiliency of the region's economy by encouraging and supporting renewable energy infrastructure; and
  - Developing renewable energy sources that reduce the amount of air emissions emitted through the combustion of fossil fuels

ENERGY OUTCOMES

- Decrease the region's consumption of fossil fuels 25 percent from 1990 levels by 2020.
- Increase the share of renewable energy generation in the region to 20 percent by 2010, with additional increases to reach 30 percent by 2020.

Resources

- Go Solar California: www.gosolarcalifornia.ca.gov
- Southern California Edison, Energy Efficiency Incentives: http://www.sce.com/RebatesandSavings
- Southern California Gas Company, Energy Efficiency Incentives: http://www.socalgas.com/energyefficiency/
- Federal Tax Incentives for Energy Efficiency: http://www.energystar.gov/

ENERGY ACTION PLAN

Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits								Other Benefits	
				Land Use	Transportation	Air Quality	Water	Open Space	Economy	Security	Solid Waste	Public Health	Climate Change
SCAG Best Practices													
		X	EN-1. SCAG should continue to work with the State to develop approaches for evaluating environmental impacts within the Compass Blueprint program, particularly energy, air quality, water, and open space and habitat.[i]	X	X	X	X	X	X			X	X
X			EN-2. SCAG should continue to develop energy efficiency and green building guidance to provide direction on specific approaches and models and to specify levels of performance for regionally significant projects to be consistent with regional plans.	X	X	X	X	X	X		X	X	X
		X	EN-3. SCAG should continue to pursue partnerships with Southern California Edison, municipal utilities, and the California Public Utilities Commission to promote energy efficiency and reduce greenhouse gas emissions in the region.			X			X			X	X
		X	EN-4. SCAG should continue to convene key decision makers to discuss energy issues and make recommendations to SCAG's Energy and Environment Committee, where appropriate.	X	X	X					X	X	X
		X	EN-5. SCAG should convene key stakeholders to evaluate and where feasible, recommend transportation measures such as congestion pricing, a transitional regional goods movement system and an environmental mitigation strategy that reduces fossil fuel consumption and uses non fuel combustion technologies.	X	X	X			X				X
		X	EN-6. SCAG should monitor and provide input towards development of state energy projections and tools, including the Integrated Energy Policy Report and similar policy documents as well as future efforts to determine the implications of energy generation and consumption for the built environment.	X	X	X						X	X
	X		EN-7. SCAG should encourage credits for clean post recycle conversion technologies to produce energy or for technologies that offset energy use or emissions.		X	X			X		X	X	X
Voluntary Local Government Best Practices													
X			EN-8. Developers should incorporate and local governments should include the following land use principles that use resources efficiently, eliminate pollution and significantly reduce waste into their projects, zoning codes and other implementation mechanisms: • Mixed-use residential and commercial development that is connected with public transportation and utilizes existing infrastructure. • Land use and planning strategies to increase biking and walking trips.[ii]	X	X	X	X	X	X		X	X	X
X			EN-9. Local governments should include energy analyses in environmental documentation and general plans with the goal of conserving energy through the wise and efficient use of energy. For any identified energy impacts, appropriate mitigation measures should be developed and monitored. SCAG recommends the use of Appendix F, Energy Conservation, of the California Environmental Quality Act.	X	X	X			X			X	X

Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits								Other Benefits	
				Land Use	Transportation	Air Quality	Water	Open Space	Economy	Security	Solid Waste	Public Health	Climate Change
X			EN-10. Developers and local governments should integrate green building measures into project design and zoning such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Energy saving measures that should be explored for new and remodeled buildings include: • Using energy efficient materials in building design, construction, rehabilitation, and retrofit • Encouraging new development to exceed Title 24 energy efficiency requirements. • Developing Cool Communities measures including tree planting and light-colored roofs. These measures focus on reducing ambient heat, which reduces energy consumption related to air conditioning and other cooling equipment. • Utilizing efficient commercial/residential space and water heaters: This could include the advertisement of existing and/or development of additional incentives for energy efficient appliance purchases to reduce excess energy use and save money. Federal tax incentives are provided online at http://www.energystar.gov/index.cfm?c=Products.pr_tax_credits. • Encouraging landscaping that requires no additional irrigation: utilizing native, drought tolerant plants can reduce water usage up to 60 percent compared to traditional lawns. • Encouraging combined heating and cooling (CHP), also known as cogeneration, in all buildings. • Encouraging neighborhood energy systems, which allow communities to generate their own electricity • Orienting streets and buildings for best solar access. • Encouraging buildings to obtain at least 20% of their electric load from renewable energy.[iii]	X	X	X	X	X	X		X	X	X
X			EN-11. Developers and local governments should submit projected electricity and natural gas demand calculations to the local electricity or natural gas provider, for any project anticipated to require substantial utility consumption. Any infrastructure improvements necessary for project construction should be completed according to the specifications of the energy provider.	X		X							X
X			EN-12. Developers and local governments should encourage that new buildings are able to incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources.	X		X			X				X
X			EN-13. Local governments should support only the use of the best available technology including monitoring, air, and water impacts for locating any nuclear waste facility.			X	X			X		X	
X			EN-14. Developers and local governments should explore programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs.		X	X			X				X
X			EN-15. Utilities and local governments should consider the most cost-effective alternative and renewable energy generation facilities.	X		X			X		X	X	X

Best Practices	Legislation	Coordination	Constrained Policies	Potential for Direct/Indirect Benefits								Other Benefits	
				Land Use	Transportation	Air Quality	Water	Open Space	Economy	Security	Solid Waste	Public Health	Climate Change
X			EN-16. Local governments and project implementation agencies should consider various best practices and technological improvements that can reduce the consumption of fossil fuels such as: • Encouraging investment in transit, including electrified light rail • Expanding light-duty vehicle retirement programs • Increasing commercial vehicle fleet modernization • Implementing driver training module on fuel consumption • Replacing gasoline powered mowers with electric mowers • Reducing idling from construction equipment • Incentivizing alternative fuel vehicles and equipment • Developing infrastructure for alternative fueled vehicles • Increasing use and mileage of High Occupancy Vehicle (HOV), High Occupancy Toll (HOT) and dedicated Bus Rapid Transit (BRT) lanes • Implementing truck idling rule, devices, and truck-stop electrification • Requiring electric truck refrigerator units • Reducing locomotives fuel use • Modernizing older off-road engines and equipment • Implementing cold ironing at ports • Encouraging freight mode shift • Limit use and develop fleet rules for construction equipment • Requiring zero-emission forklifts • Developing landside port strategy: alternative fuels, clean engines, electrification		X	X			X			X	X
X		X	EN-17. Utilities should consider increasing capacity of existing transmission lines, where feasible.	X		X		X			X	X	
X		X	EN-18. Utilities should install and maintain California Best Available Control Technologies on all power plants at the US-Mexico border.			X	X					X	X
		X	EN-19. Subregional and local governments should explore participation in energy efficiency programs provided by their local utility such as the Ventura Regional Energy Office, South Bay Energy Savings Center, and the San Gabriel Valley Energy Wise program. These programs can offer customized incentives and public awareness campaigns to reduce energy consumption.			X			X				X

Best Practices	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits								Other Benefits	
				Land Use	Transportation	Air Quality	Water	Open Space	Economy	Security	Solid Waste	Public Health	Climate Change
SCAG Initiatives													
		X	EN-1S: SCAG should consider energy uncertainty into its future planning and programming, including the Regional Transportation Plan and the Regional Transportation Improvement Program.	X	X	X			X	X		X	X
		X	EN-2S: SCAG should continue to develop, in coordination with the California Air Resources Board, a data and information collection and analysis system that provides an understanding of the energy demand and greenhouse gas emissions in the SCAG Region.	X	X	X	X					X	X
Federal and State Government Strategies													
	X		EN-3S: The Secretary of Energy, in coordination with other relevant federal agencies, should establish a peak oil strategy to better prepare the United States for a peak and decline in oil production. Such a strategy should include efforts to reduce uncertainty about the timing of a peak in oil production and provide timely advice to Congress about cost-effective measures to mitigate the potential consequences of a peak.		X	X			X	X	X	X	X
	X		EN-4S: The Federal Government should increase Corporate Average Fuel Economy (CAFE) to a level that will reduce our dependence on foreign oil and reduce greenhouse gas emissions.	X	X	X			X	X	X	X	X
	X		EN-5S: The Federal Government should develop a national consensus on alternative fuel research and development.		X	X			X	X	X	X	X
	X		EN-6S: As recommended by the California Energy Commission, the state should continue to fund the Blueprint Planning Grant program and Blueprint Learning Network to assist regional agencies and local governments in developing regional growth plans. The grant program should include energy consumption and greenhouse gas emission reduction as primary outcomes of the blueprints developed within the program. Technical and funding assistance for local governments should be included in this.	X	X	X			X			X	X
	X		EN-7S: The Federal and State Government should promote clean, cost-effective, reliable, domestic renewable energy generation, such as solar power and wind turbines.		X	X			X	X		X	X
	X		EN-8S: State and federal lawmakers and regulatory agencies should pursue the design of programs to either require or incentivize the expanded availability and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price.		X	X			X	X		X	X
	X		EN-9S: The State and Federal governments should encourage mileage-based vehicle insurance as a voluntary program.		X	X			X				
Voluntary Local Government Best Practices													
X			EN-10S: Local governments should employ land use planning measures, such as zoning, to improve jobs/housing balance and creating communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel.[iv]	X	X	X		X	X			X	X

Footnotes

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