Monterey Bay Regional Energy Plan

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Part I of II

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Note: An electronic version of this Plan is available on Compact Disc (CD) that includes Parts I, II and the Appendices as well as useful links to additional background resources and source documents for further review.

[1] Rebuild America is a network of community-driven voluntary partnerships that foster energy efficiency and renewable energy in commercial, government and public-housing buildings. The program's goals are to: conserve energy, accelerate use of the best energy technologies, save money, reduce air pollution, lower U.S. reliance on energy imports, help revitalize aging city and town neighborhoods, and create "smart energy" jobs. In addition, Rebuild America works to overcome market barriers that inhibit use of the best technologies. These barriers include the lack of knowledge of building owners and managers in both the public and private sectors of the best technologies, financing mechanisms, savings potential and other benefits of energy efficiency. Rebuild America seeks to spread knowledge, develop projects to stimulate market change, provides analyses and advice in support of the best technologies and create proactive networks between state and local governments and the private sector. See http://www.rebuild.org/.

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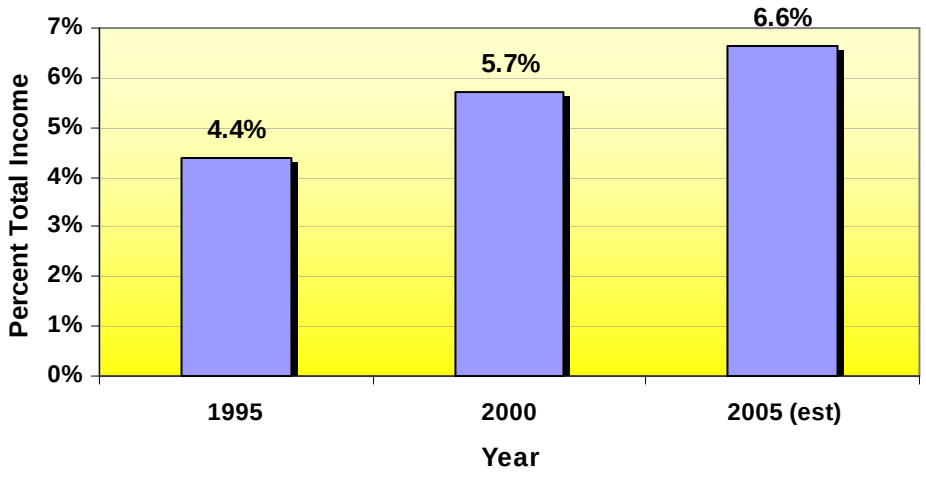
1 Background and Introduction

The current high prices that the state and region are paying for electricity, natural gas and transportation fuels has reminded us that energy is a vital commodity for society that can have large impacts on the economy. In the past, many considered energy conservation and efficiency merely a "good virtue." That can no longer be the case. In the last decade, rising electricity, natural gas and transportation fuel costs have significantly outpaced that of other products and services and increased the region's overall costs. From 1995 to 2005, total energy costs for the region (including electricity, natural gas[2], gasoline and diesel fuels) have increased by 225% from $557 million in 1995 to a forecast of approximately $1.2 billion in 2005[3]. Total energy costs as a percent of total income[4] have increased 51% from 4.4% in 1995 to 6.6% in 2005 (estimated) as is shown in Figure 1.

Figure 1: Total Energy Costs as a Percent of Total Regional Income



In the past, high prices would drive technology to increase supplies that would moderate prices. Today, we would expect the same to occur, but there are other factors at work. The growing global economy has resulted in a significant increased demand from rapidly growing foreign countries such as China and India. In addition, despite the United States' decision to not ratify the Kyoto Protocol, many are growing increasingly concerned over the impacts of

[2] Natural gas costs exclude electric generation fuel costs.

[3] See Appendix C for all assumptions and data used in support of the Plan.

[4] Regional total income was estimated by using the average per capita income from the 2000 Census, and estimating 1995 and 2005 total per capita income through extrapolation (assuming 2% growth per year), then multiplying times total population.

energy production and consumption on the production of greenhouse gases and global warming[5].

Currently, the region imports nearly all of its energy, with the exception of about 14 megawatts of renewable electric generation[6], [7].

While the State of California is much better off today than it was during the recent energy crisis of 2000-2001, most agree that the State will continue to experience similar challenges with energy in the foreseeable future. While demand continues to grow with population and the expanding economy, the need for new electricity and natural gas supplies is beginning to outstrip our ability to provide adequate infrastructure. Over one-third of the existing power plants throughout the State will need to be re-powered or replaced in the next ten years. Dwindling supplies of domestic and North American natural gas supplies are driving the need for building costly Liquid Natural Gas (LNG) terminals throughout the west coast, further tying our economy to foreign energy sources. Oil refineries are running at near maximum capacity.

As a result, energy conservation, efficiency and renewable resources have grown in their importance from a public policy perspective and for their positive contribution to our energy system reliability, diversity, economic vitality and quality of life.

The critical energy challenges that continue to face the region include:

- The prospect of continued higher prices for all forms of energy for the next decade, particularly given the uncertainty of future natural gas supplies and the impacts of increasing global demand on all fossil fuels;
- Continued growing demand for all forms of energy;
- Difficulty permitting and siting supply and delivery infrastructure;
- Continued uncertainty surrounding market and regulatory design.

AMBAG's Regional Energy Plan is intended to lay out the region's joint approach to establishing an energy vision, objectives, goals and action plans to mitigate future energy impacts on the region. Continued growth of the region over the next 25 years will add over 250,000 persons and over 83,000 housing units[8]. Population and housing are two of the primary drivers for energy demand. This growth will continue to strain our energy infrastructure and limited natural resources unless we can implement strategies that transform our communities with 21st century energy technologies. These recent technologies must have a more appropriate balance between fossil-fuels and renewables, as

[5] Department of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health. CLIMATE CHANGE AND HEALTH IN CALIFORNIA - A PIER RESEARCH ROADMAP. Prepared for the California Energy Commission, CEC-500-2005-093. May 2005.

[6] Fossil-fueled power plants, such as the Moss Landing Power Plant import all their fuel sources so are not consider "indigenous energy resources."

[7] Not including systems installed through the Statewide Self-Generating Program. This data was not available at the time of the writing of this Plan.

[8] 2004 State of the Region Report for Monterey, San Benito, and Santa Cruz Counties, AMBAG, January 2004.

well as grid-based and local supplies. The recent energy crisis of 2000-2001 reminded us that that if we do not plan adequately, the consequences can be significant and costly.

AMBAG anticipates updating the Plan at least every 5 years.

1.1 Recent AMBAG Energy Initiatives

In August 2001, AMBAG presented a Regional Energy Conference with state, regional and local leaders providing perspectives on the issues and opportunities. In April 2004, AMBAG formed an Energy Advisory Committee (EAC) to oversee the completion of an assessment of the feasibility of establishing a Monterey Bay Regional Energy Office for the benefit of the residents and businesses in the Monterey Bay region, including Monterey, San Benito and Santa Cruz Counties. The EAC was comprised of a wide variety of stakeholders including local government, non-profits, local businesses and Pacific Gas & Electric (PG&E). The complete membership of the EAC is listed in Appendix A. Following completion of the project, the EAC made several recommendations, including continuing to pursue potential funding opportunities to support regional energy planning and program efforts, in particular, for the completion of a Regional Energy Plan that would better educate local constituents about local energy needs and the potential contribution of energy efficiency programs to local issues, such as mitigating the need for future energy infrastructure.

In March 2005, AMBAG received a grant from the U.S. Department of Energy (DOE), through the California Energy Commission (CEC), to complete the development of a Regional Energy Plan. In addition to reconvening the EAC, the following steps were agreed to be pursued to complete the objectives of the project:

- To develop a background Energy Report that will educate local stakeholders and decision makers on the relevant issues that needed to be considered in developing a Regional Energy Plan (the Background Energy Report was incorporated into Part II of the Plan).

- To develop a draft Regional Energy Plan for consideration by the Energy Advisory Committee and the AMBAG Board. The Plan will build on the Background Energy Report and will specifically develop and provide the following: 1) Goals for the Monterey Region; 2) Preferred implementation strategies for meeting the future energy needs of the Monterey Bay Region, 3) Potential programs and strategies to assist the region to achieve these goals.

- To develop a Public Participation Program that will ensure the involvement of the public in the development of the Energy Plan and to solicit input from the public, local business and other constituents.

1.2 Local, State and Federal Energy Planning

One of the key conclusions of the recent energy crisis was that long-term policies and planning horizons are vitally important since energy infrastructure can take decades to permit and build. In addition, energy infrastructure has a useful life of over 40-50 years. Energy planning primarily occurs at the utility, state, and in some cases, on a western U.S. regional (for transmission and bulk power supply planning) and federal level (for overall fuel planning

and forecasting). That has been changing in recent years as many local governments are developing and adopting local energy policies.

So why would the AMBAG need a Regional Energy Plan? The importance of local planning is essential and well understood for issues like transportation, land use, water and housing, but less understood for energy. In many cases, public policy decisions developed at the state level does not always consider an individual region's unique needs and resources. Many decisions and policies can have a disproportionately negative affect on a community or region (e.g. siting of liquid natural gas plants, power plants and transmission lines). A Regional Energy Plan can serve as a mechanism to educate local consumers and officials, as well as to achieve broad consensus on key energy issues that enable the region to actively and effectively participate in the state regulatory and legislative processes.

The implementation of many state energy policies are driven primarily from the local level. For example, three of the State's priorities are outlined in the *California Energy Action Plan* are energy efficiency, renewables and distributed generation. Many local governments are not only implementing aggressive programs to support these priorities, they are also considering how these issues are addressed in local General Plans and other ordinances. The degree to which Title 24 building energy codes are implemented relies on a local government's commitment to that process.

Energy efficiency studies and program planning normally occurs at the state or utility-wide level. However, achieving optimal energy efficiency in a local community cannot be achieved without local involvement in planning. Energy efficiency studies and program planning also more often occurs at the state or utility-wide level. Better focused energy programs could reach more consumers and better serve the specific needs of local constituents through a higher level of local involvement. In addition, the manner in which communities are planned and developed largely determines their energy consumption characteristics for decades. For example, mixed-use planning that incorporates clean self generation (e.g. combined heat and power, solar) into new developments can reduce the need for additional electricity transmission and distribution infrastructure. Local governments can also go beyond required codes and ordinances to prescribe and achieve broader goals such as local resource sustainability[9]. Some cities have enacted ordinances to promote upgrading homes to meet energy requirements at time-of-sale. Other communities offer incentives for developers that exceed Title 24 requirements or incorporate clean self-generation into construction projects.

The benefits to local governments and communities that engage in conscious energy planning are significant, including the potential to:

Improve the quality of life for their citizens;

Retain energy dollars in the local economy;

Improve local air quality; and

Meet or exceed state and local policy goals.

[9] Sustainable development is an integrated, systems approach to development, which attempts to maximize the efficient and effective long-range management of land, community, and resources. Sustainable development principles may be applied to the overall development, specific policies and programs, and/or the implementation of the general plan.

1.3 Overview of Current Energy Planning

During the years leading up to California's attempt to restructure the electric industry in 1998, many of the traditional planning processes were essentially abandoned with the assumption that the market would deliver adequate electricity supply to meet consumer demand. The energy crisis of 2000-2001 proved this market structure and lack of planning to be very shortsighted. The failure of this model led many cities, counties and regions to develop their own energy plans.

In the last few years, the State has reinstituted policies and planning processes to ensure future reliability of electricity supply. Energy policy for electricity and natural gas is established and carried out by a number of entities throughout the State of California, including the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), the California Independent System Operator (CA-ISO) and the investor-owned and municipal utilities.

Overall state policy is driven by the State Legislature and the Governor, and codified in State Law (Public Utilities Code[10]). According to the CPUC, the current regulatory priority is "to continue to recover from the energy crisis of 2000-2001, resolve the remaining issues that led to the crisis, and to put in place policies that prevent a similar event from happening in the future." The State's energy plan is spelled out in several policy documents, including the California Energy Action Plan (EAP), the Integrated Energy Policy Report (IEPR) and the Governor's Energy Plan.

At the federal level, energy policy is driven by federal law and agencies such as the Federal Energy Regulatory Commission (FERC) and the U.S. Department of Energy (DOE). Recently, the 109th Congress has been moving toward passing a comprehensive energy bill entitled The Energy Policy Act of 2005 (H.R.6). This omnibus energy bill would establish broad federal energy policies and programs (Summarized in Appendix B).

1.3.1 California Energy Action Plan (EAP)[11]

The EAP establishes shared goals of three state energy agencies: the California Energy Commission (CEC), the Consumer Power and Conservation Financing Authority (CPA) (no longer an operational state agency), and the Public Utilities Commission (CPUC). The document outlines specific actions to ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers.

The EAP establishes a "loading order" of energy resources that is intended to guide planning decisions. This loading order is as follows:

1. Increased conservation and energy efficiency;

2. Increased use of renewable energy resources and distributed generation;

[10] http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc&codebody=&hits=20

[11] http://www.cpuc.ca.gov/static/industry/electric/energy+action+plan/index.htm

3. Increased investment in clean, fossil fuel, central-station generation; and

4. Improved electricity transmission grid.

1.3.2 Integrated Energy Policy Report (IEPR)[12]

The IEPR[13] is the foundation of energy policies and decisions affecting the state. The IEPR is updated biennially, and consists of a Policy Report and three subsidiary volumes, including 1) Electricity and Natural Gas, 2) Transportation Fuels, Technologies, and 3) Infrastructure and Public Interest Energy Strategies. The report assesses major energy trends and issues facing the state. These results are used to recommend energy policies that balance broad public interests to conserve resources, protect the environment, ensure energy reliability, enhance the State's economy, and protect public health and safety.

1.3.3 Utility Long-Term Electricity Procurement Plans[14]

The CPUC oversees the three investor-owned utility's filings of Long-Term Procurement Plans (LTPP)[15], which plans for and procures the necessary electricity resources to provide reliable service to customers for 2005 through 2014. The LTPPs are to meet the goals from the other proceedings, including the "loading order" of preferred resources established in the EAP.

In these procurement plans, the CPUC directed the utilities to procure the maximum feasible amount of renewable energy in procurement solicitations in order to achieve the State's Renewable Portfolio Standard (RPS) targets. The RPS requires an annual increase in renewable generation equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017[16]. The utilities, including PG&E, are aggressively implementing this policy.

In addition, the CPUC adopted a policy that reflects and attempts to mitigate the impact of greenhouse gas (GHG) emissions on global climate change by employing a "carbon adder" when evaluating fossil-fueled generation. PG&E filed its LTPP on July 9, 2004[17], and the CPUC approved this plan on December 20, 2004[18]. Currently, PG&E has a solicitation open for procurement of generation and renewable resources[19] to implement their LTPP.

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[12] http://www.energy.ca.gov/energypolicy/index.html

[13] Established in 2002 through Senate Bill 1389 [Chapter 568, Statutes of 2002, Bowen].

[14] http://www.cpuc.ca.gov/static/industry/electric/utilities_plans.htm

[15] Decision 04-01-050 (January 22, 2002) (the "Long Term Procurement Decision"), the April 6, 2004, Order Instituting Rulemaking to Promote Policy and Program Coordination and Integration in Electric Resource Planning (OIR), and the Assigned Commissioner's Ruling and Scoping Memo issued June 4, 2004.

[16] SB532 (Sher-Palo Alto) would accelerate this goal to 20% by 2010.

[17] http://apps.pge.com/regulation/search.aspx?CaseName=Gen%20Resource%20Planning%20OIR

[18] http://www.cpuc.ca.gov/word_pdf/FINAL_DECISION/43224.doc

[19] http://www.pge.com/suppliers_purchasing/wholesale_electric_supplier_solicitation/

In its LTPP filing, PG&E stated:

> *"we must move ahead with new resource commitments now—both demand side and supply side—to avert a reliability crisis potentially looming on the horizon. We have an important opportunity to embark upon a new, more progressive path that strikes the right balance in pursuing reliable service, a cleaner environment, reasonable rates, and a stable and predictable wholesale and retail market structure. We offer a robust, diverse, climate-friendly and policy-responsive portfolio that fully recognizes the environmental and financial risks associated with greenhouse gas emissions and our plan is consistent with our pro-active approach to climate change."*

2 Regional Energy Plan Objectives, Goals and Action Plan

This section presents proposed regional objectives, goals and action steps for the region. These goals and strategies are presented in the following areas:

1. Energy Information and Education;
2. Energy Conservation and Efficiency;
3. Clean Distributed Generation and Renewable Resource Development; and
4. Transportation Energy.

This Section lays out long-term goals and objectives for the region that would be accomplished in the next 10 to 15 years. The proposed action steps that are presented are proposed to be considered for implementation in the near-term timeframe (next 1 to 5 years).

In developing these goals and objectives, assumptions were made with respect to the costs, regulatory constraints, and other barriers that may either inhibit or support their accomplishment. For most of these goals and action steps, the necessary economic and regulatory conditions exist. For example, achieving the goal to implement the targeted level of energy efficiency savings is possible with readily available technologies and financial incentives. No insurmountable barriers (other than local commitment or resolve), would impede the region from successfully taking the proposed action steps and achieving the goals.

The goals and objectives are highly recommended, but not mandates for local agencies. Some of these proposed actions are designed to be taken by individual agencies. Some may be taken by a collaborative or public-private partnerships. Others may be taken by AMBAG itself, working with its member agencies to take advantage of leveraging each other's efforts and quantities of scale. In any case, proactive actions are necessary in order to respond to the growing energy challenges that lay before us.

Goals and action steps have not been developed for areas such as electricity and natural gas infrastructure development (i.e. grid-based generation and transmission), market design, reliability and other areas that are outside what one would expect the region to have a reasonable ability to impact. Many state agencies and PG&E are actively pursuing these objectives. For example, PG&E is procuring sufficient energy supply through its LTPP. Gas supply and infrastructure is the subject of two-year planning process and the *California Gas Report*. Transmission infrastructure is planned through an extensive stakeholder process led by the CA-ISO and a 5-Year Transmission Plan filed by PG&E. That is not to say that the region should not support these overall policies and objectives. For example, proposed construction of new transmission lines or power plants in the region may require the region to engage in the issues.

2.1 Energy Information, Education and Local Capacity Building

2.1.1 Background

When it comes to energy efficiency and other alternatives, knowledge is truly power. Energy can often be a very arcane subject to the consumer. Energy programs pursue two basic strategies- information and education. These strategies empower consumers with the knowledge to make better choices. The strategies also attempt to influence behavior at the time of a decision (through incentives and rebates). Some information and education programs are most effective when implemented at the state level, such as the State's "Flex Your Power" broad outreach campaign. Other education programs are best offered at the utility level, such as training of industry associations and energy professionals. To some extent, delivery of information and education to businesses and consumers needs to occur at the local level. Many community organizations are better positioned than most to deliver locally-tailored information programs through well-established networks.

An informed public can also take many actions without government subsidies. It is widely known that adoption of simple, no-cost conservation strategies can reduce energy consumption by 10 to 15% (as was done during the recent energy crisis).

Millions of dollars are spent each year on state, utility and other information and education programs. The region needs to better access these programs and resources to derive their full benefit.

The primary delivery vehicle for energy education is PG&E's education and outreach program through training and workshops. These programs are conducted locally and at the *Pacific Energy Center* (located in Downtown San Francisco), the *Energy Training Center* (Stockton) and the *Food Service Technology Center* (San Ramon). Each of these facilities is 2-3 hours driving time from the region, so it is unlikely that many from the region participate in their offerings. PG&E also has a comprehensive web site[20] with a wide range of information designed to educate the consumer. Additionally, very informative energy education web sites are available from Flex-Your-Power, the California Energy Commission, the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), the American Council for and Energy Efficient Economy (ACEEE), and many other organizations.

2.1.2 Objective

Increase the availability of energy education in the region to empower consumers to make more informed decisions regarding conservation, energy efficiency, distributed generation, renewables and other alternatives and to build local capacity for energy services professional to serve consumers needs.

2.1.3 Goals

- Increase the overall effectiveness and penetration of energy education available to all sectors of the region.
- Increase the local capacity for the region to provide energy efficiency services.

[20] http://www.pge.com/

2.1.4 Action Steps

1. Conduct an annual assessment of the local information and training needs of the region, possibly to include regional energy excellence awards, K-12 education, local workshops and training sessions, etc. Based on the identified needs, develop information and training activities to target these needs.

2. Conduct an assessment of local availability of energy products. Develop an action plan to expand their availability.

2.2 Energy Conservation and Efficiency

2.2.1 Background

Conservation and efficiency offer a significant hedge to volatile and rising energy prices and contribute to achieving better energy diversity. According to a recent utility energy efficiency analysis, as much as 500 million kilowatt-hours (kWh) of electricity energy savings and $76 million in costs savings can be achieved within the region by 2013 (See Part II). In addition, approximately 7.5 million therms of natural gas savings and over $7 million in cost savings are possible for the region through 2013. The State of California has made energy efficiency its first priority for energy resource procurement, recognizing that a kilowatt saved is the cheapest kilowatt available. The utilities are preparing to increase funding for cost-effective energy efficiency programs by two-fold in the next few years[21].

A broad range of energy efficiency programs are available that provide incentives to encourage the purchase of energy efficient equipment and support practices for the design and construction of energy efficient buildings and homes. A complete list of these programs can be found in Appendix C[22].

2.2.2 Objective

Decrease per capita electricity and natural gas use through increased energy conservation and efficiency measures to minimize the need for new generation, reduce emissions of toxic and criteria pollutants and greenhouse gases, improve energy reliability and contribute to price stability.

2.2.3 Goals

- Deliver energy savings from the region that exceed the proportionate share of the goals established by the CPUC for the state and PG&E's service territory, as follows:
  - Cumulative electricity consumption savings of 507 gigawatt-hours (GWh) by 2013.
  - Cumulative electricity peak demand savings of 110 megawatts (MW).
  - Cumulative natural gas savings of 7.8 million therms (MMth)
- Strive to reduce electricity and natural gas consumption in all public facilities by at least 20% by 2015 to voluntarily comply with the Governors Executive Order S-20-04 (See Appendix F)[23].
- Increase the local capacity for the region to provide energy efficiency products.

[21] PG&E 2005 funding for energy efficiency programs is $235.7, plus $95 million for demand response.

[22] Energy efficiency programs are currently being developed for 2006-2008.

[23] From a baseline year of 2000. Consumption to be normalized for growth.

2.2.4 Action Steps

1. Conduct an assessment of local capacity and availability for energy products. Develop an action plan to expand their availability.

2. AMBAG agencies should maximize all opportunities to take advantage of existing funding and technical resources to pursue energy efficiency, including participation in programs such as the ABAG/AMBAG Local Government Energy Partnership Program[24].

3. Establish a mechanism to accurately account for energy savings that are achieved in the region through accounting for energy efficiency program activity.

4. Work to develop and promote a comprehensive portfolio of energy efficiency, demand reduction, renewable and distributed generation programs targeting all sectors to help achieve the long-term potential for the region (See Appendix C for a complete list of current energy programs).

5. Evaluate various implementation and financing mechanisms to promote and encourage energy efficiency and demand reduction projects in all sectors, including:

    a. Evaluation of implementing a Special Energy Financing District that provides on-tax bill financing (See Part II, Section 5.3);

    b. Working through AMBAG's existing Joint Powers Authority (JPA) mechanism to pursue joint project development and implementation;

    c. Evaluation of the formation of a Community Energy Authority (CEA)[25] to issue bonds to fund projects; and

    d. Forming revolving funds for public projects to reinvest a portion of energy savings into future energy savings project development.

6. Consider establishing a higher standard for public buildings to serve as an example for others throughout the community and to use these projects as case studies to support regional energy outreach and education. For example, public agencies may design, construct and operate all new and renovated publicly-owned facilities as Energy Star, Leadership in Energy and Environmental Design (LEED)[26] Certified," its equivalent (or higher).

7. Evaluate energy retrofits and design options using life-cycle cost analysis that consider all costs of the building including first costs, as well as future operational costs.

[24] www.abag.ca.gov/lgep

[25] AB 1659, passed in 1984 [California Government Code (52030-52190)], enables cities and counties to establish a CEA, similar to a housing authority. CEAs can plan and enact programs and projects for low-income, energy efficiency or renewable energy development, and can issue tax-exempt bonds and access other tax-exempt financing or state and federal sources to fund them. Recently, several CEAs have been formed in Humboldt and Ventura Counties.

[26] LEED is Leadership in Energy and Environmental Design, the certification program of the U.S. Greenbuilding Council, see http://www.usgbc.org/.

8. Encourage purchase of Energy Star products whenever cost-effective (considering life-cycle costs).

9. Encourage new commercial and residential buildings to exceed minimum efficiency standards through public-good programs or local government incentives (e.g. plan check fee reduction or expedite).

10. Encourage the upgrade of older, existing buildings to meet energy code upon resale through the consideration of a time-of-sale energy efficiency rating and certification process similar to Monterey County Water Resources Agency Ordinance No. 3932 (Mandatory water conservation regulations- Appendix D).

11. Encourage public agencies to conduct assessments of all facilities (and electric and mechanical equipment) in the next 3 years to identify potential energy savings opportunities. Establish a plan to accomplish all projects identified in the next 10 years.

12. Consider solar hot water heating where appropriate to reduce natural gas consumption in public facilities.

2.3 Clean Renewable and Distributed Generation Resources

2.3.1 Background

Second only to energy efficiency and demand response, the increased use of renewable and clean distributed generation energy resources is a high priority of the State in order to diversify the state's fuel use and over-reliance on the overburdened electricity grid.

Currently, the region has approximately 14 MW of renewable energy generation capacity[27], including solar, wind, municipal wastewater digester gas, landfill gas and solar. It is particularly noteworthy that the growth in solar photovoltaics (PV) in the AMBAG region has far exceeded the growth of similar-sized systems for the rest of the State of California on a proportional basis[28]. While the state has seen an increase of nearly a factor of 10, the region's solar capacity has increased by over 29 times, including more than 650 new systems with a total capacity of 2.1 MW (not including the Self-Generation Program). This represents nearly three times the solar that was installed statewide, and 1.5 times the solar installed in the PG&E service territory on a proportional basis).

Assessing and developing additional in-region renewable resources would assist the state in achieving its Renewable Portfolio Standard goals, diversify the regions fuel needs, as well as potentially create energy cost savings and revenues for the host of a system.

Distributed generation locates power generation at or near the place it is needed. This approach has numerous benefits, including increasing the overall efficiency of the distribution grid and improved overall system reliability and security. Currently, PG&E is mandated to fund $128 million per year of incentives for self-generation and renewables[29]. At this point in time, the region has not quantified how much additional cost-effective renewable energy and distributed generation potential exists in the county. Part II addresses the potential to a limited extent.

2.3.2 Objective

Increase the use of renewable and clean distributed generation resources in the region to support the state Renewable Portfolio Standard, to increase the fuel diversity of the region, to reduce the reliance on the stressed transmission infrastructure and to reduce overall environmental impacts of energy production and consumption of the region.

2.3.3 Goal

For renewable and distributed generation resources, to the extent that it is practical, provide local capacity to make a positive contribution to the State's and to PG&E's goals. When possible, continue to exceed the proportionate share of the region's contribution toward these goals.

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[27] Not including systems installed through the Statewide Self-Generating Program. This data was not available at the time of the writing the Plan.

[28] For systems less than 30 kilowatts (kW) capacity.

[29] Funding is from ratepayer, not shareholder dollars, see http://pge.com/selfgen/ and http://www.energy.ca.gov/renewables/index.html

2.3.4 Action Steps

1. Complete an assessment of potential renewable and distributed generation resources, including but not limited to municipal waste energy production capacity from landfill gas that is not yet productive, wind and solar.

2. Evaluate various implementation and financing mechanisms to promote and encourage renewable and distributed generation resources in all sectors, including:

    a. Implementing a Special Energy Financing District that provides on-tax bill financing (See Part 2);

    b. Working through AMBAG's existing Joint Powers Authority (JPA) mechanism to pursue joint project development and implementation;

    c. Formation of a Community Energy Authority (CEA)[30] to issue bonds to fund projects; and

    d. Forming revolving funds for public projects to reinvest a portion of energy savings into future energy savings project development.

3. Evaluate the potential for a Request for Proposals for public and public-private joint ventures to develop renewable and distributed generation projects in the region.

4. Consider adopting local ordinances to encourage or mandate new homes to be pre-wired and pre-plumbed for solar photovoltaic and solar hot water heating installations and new development providing a target level of distributed generation and renewables.

5. Work with PG&E to leverage the existing Self-Generation Program to promote and maximize the utilization of clean, distributed generation resources in the region (e.g. through local workshops, case studies, etc).

6. Support and promote demonstrations of renewable and distributed generation technologies in public and private projects to and leverage these demonstrations to promote the achievement of the goals.

[30] AB 1659, passed in 1984 [California Government Code (52030-52190)], enables cities and counties to establish a CEA, similar to a housing authority. CEAs can plan and enact programs and projects for low-income, energy efficiency or renewable energy development, and can issue tax-exempt bonds and access other tax-exempt financing or state and federal sources to fund them. Recently, several CEAs have been formed in Humboldt and Ventura Counties.

2.4 Transportation Energy[31]

2.4.1 Background

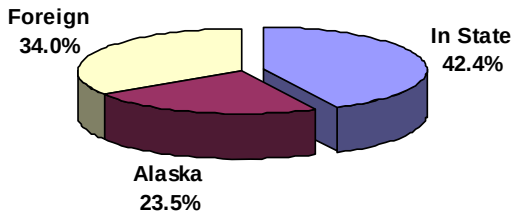
Petroleum will be the primary source of California's transportation fuels for the foreseeable future. Over the next 20 years, the AMBAG region will see a 44% increase in vehicle miles traveled (VMT) and a gasoline/diesel consumption increase of 35%. Over the same time period, a 1% increase in vehicle efficiency would result in the region saving over 1 billion gallons of fuel and an estimated $4.5 billion in costs. A 2% increase in efficiency would yield a savings of 1.8 billion gallons and $7.5 billion.

The demand for transportation fuels in California is increasing at an unsustainable rate, surpassing in-state refining capacity. In the past 20 years, the demand for gasoline and diesel has increased by 53 percent. Californians now consume nearly 49.5 million gallons of gasoline and diesel each day, accounting for almost half of all the fossil fuel energy consumed in the state each year.

Several factors are driving this increase, including:

- Population growth and an increase in the number of on-road vehicles;
- Land-use patterns that place jobs and housing increasingly farther apart (i.e. sprawl);
- The shift in consumer preference to larger, less fuel efficient motor vehicles; and
- A lack of viable and cost-effective alternatives to petroleum fuels.

Figure 2: Sources of California Petroleum (2003)



The primary sources for petroleum consumed in California are from out of state (See Figure 2). In addition, California imports about four million gallons of gasoline and diesel each day (refined outside the State), a tenuous situation given the limited number of out-of-state refineries currently producing California gasoline. Gasoline, diesel, and blending components must be imported by a marine tanker, further increasing the risk to the environment, since California is not connected by pipeline to refining centers in other states. The state's marine facilities—where imports are off-loaded, stored, and distributed—operate at or near capacity. Since inventories represent only 18 days of supply on average and replacement supplies can take up to eight weeks to reach marine terminals, an upset in the petroleum system can immediately translate into tight supplies, higher prices at the pump and an economic crisis.

[31]This Transportation Section was added after the final Energy Advisory Committee meeting at the suggestion of the Committee.

As demand continues to rise, imports of foreign crude oil will increase as in-state and Alaskan supplies diminish. Additionally, the transition to ethanol as the only oxygenate for California gasoline will reduce refinery production by as much as 5%. Low-sulfur fuel regulations scheduled to take effect in 2006 also may further limit refining production. With refineries operating close to full capacity, daily imports of gasoline and diesel will more than double to 10.1 million gallons by 2010. Unless import facilities expand, gasoline and diesel markets will become increasingly volatile, with the likelihood of supply shortages and more prolonged periods of high prices.

The last refinery built in California was in 1969. Since that time, several refineries have shut down, reducing statewide refining capacity by nearly 20%, forcing refineries to operate near maximum capacity for much of the year. Either the industry must expand its import and storage facilities, or the state needs to implement much higher levels of efficiency improvements, otherwise supply constraints and price volatility will continue. In spite of their age, the industry has upgraded and modernized its refineries over the years in response to meet the state's tough fuel specifications. These refineries are now some of the most advanced and produce the cleanest-burning fuels in the world. Since the mid-1990s, refiners have been able to increase production of gasoline and diesel at existing facilities through process improvements, but not enough to keep pace with the steadily growing demand. Most recently, the industry is making $800 million in modifications to its terminal facilities in response to the Governor's ban on Methyl Tertiary Butyl Ether (MTBE) without disrupting fuel supplies. As a consequence, California increasingly relies on imports of blending components and finished products from other states and countries to meet demand.

The knowledge of environmental and health impacts of transportation energy use seems to be growing. A recent report released by USC's Keck School of Medicine suggests that the closer children live to a freeway or major thoroughfare, the more likely that they will develop asthma[32].

California does not have similar authority for setting transportation energy standards as it has for electricity and natural gas. In 1975, Congress established corporate average fuel economy (CAFE) standards for new passenger cars and light trucks. Current CAFE standards are 27.5 miles per gallon for cars and 20.7 miles per gallon for light-trucks (including Sport Utility Vehicles and minivans). These standards have not changed since 1985. Accordingly, automobile manufacturers have not had the incentive to improve new vehicle fuel economy. Further, sales for light trucks have increased to nearly 50 percent of all new vehicles sold in California. These factors combined have contributed to the dramatic rise in gasoline demand.

Recently, the CEC and the California Air Resources Board (CARB) examined a range of options to reduce petroleum consumption in California[33]. In the near term, the state can quickly realize significant savings by establishing a tire efficiency program, requiring government fleets to use the most efficient vehicles in a given class, and educating consumers about proper vehicle maintenance. Together, these actions can reduce fuel demand by three to five percent.

[32] Study authored by Dr. Rob McConnell, associate professor of preventive medicine at USC's Keck School of Medicine.

[33] Reducing California's Petroleum Dependence, California Energy Commission, California Air Resources Board, August 2003, P600-03-005.

The state has taken action on two of these measures. SB 844 [Chapter 645, Statutes of 2003, Nation] requires the CEC to establish a tire testing procedure, a tire efficiency rating system, and replacement tire efficiency standards. The Department of General Services also is revising its vehicle procurement requirements to include efficiency as a primary criterion.

The report also showed that improving the fuel efficiency of new vehicles would dramatically reduce petroleum demand and that the efficiency of new cars and light trucks can be improved significantly with existing and emerging automotive technologies. If the combined fuel economy of new cars and light trucks were improved to 40 miles per gallon (mpg) beginning in the 2008 model year, the growth in demand for on-road transportation fuels would begin to decline by the year 2010 and continue to decline to current levels by 2020.

Additional options exist through the increased use of alternative fuels, including natural gas, ethanol, and liquefied petroleum gas (LPG), non-petroleum-derived diesel fuel such as biodiesel, electricity and hydrogen. Currently, more than 60,000 cars, transit buses and trucks currently operate on natural gas and LPG, along with nearly 13,000 electric vehicles. California also has in excess of 800 natural gas and LPG fueling stations.

Increased use these fuels faces significant uncertainties such as the availability of new vehicle technologies, the cost and availability of new fueling infrastructures, and acceptance of these fuels by consumers. The recent supply and price volatility experienced in the natural gas market has also put a damper on using more natural gas fueled vehicles

Lastly, transportation fuel demand can be reduced through alternative land use choices. For example, improved land use planning can reduce the number and length of automobile trips and improve travel via transit and non-motor mobility options. The net result would be fewer vehicle miles traveled (VMT) and reduced fuel demand[34].

2.4.2 Objective

Reduce the region's growing demand for fossil fuels for transportation uses.

2.4.3 Goal

Consider a goal of reducing the region's overall consumption of on-road gasoline and diesel to 15% below 2003 levels (adjusted for normal growth) by 2020.

2.4.4 Action Steps

1. Seek funding to complete a more comprehensive transportation energy study that better defines the potential fuel and cost savings through more efficient use of transportation technologies including, but not limited to land-use planning strategies and measures that could be implemented as part of the Regional Transportation Plan.

[34] Effect of Land Use Choices on Transportation Fuel Demand In Support Of The 2005 Integrated Energy Policy Report, May 2005, CEC-600-2005-019.

2. Seek funding to support the development of a public information program on transportation energy conservation and efficiency, which may include informing consumers of the fuel saving benefits of efficient tires, proper tire inflation, vehicle maintenance and alternative fuel and hybrid vehicles.

3. Work through AMBAG member agencies to encourage greater use of fuel efficient and less polluting vehicles in public fleets, including school buses and refuse collection vehicles, leveraging incentives available through the Monterey Bay Unified Air Pollution Control District[35].

4. Support any efforts to influence Congress and the Department of Transportation (if appropriate) to begin to increase the fuel economy of new passenger cars and light trucks (CAFE standards).

[35] http://www.mbuapcd.org/.

3 Conclusions and Preliminary Recommendations

Although the most recent energy crisis has subsided from the headlines, many challenges remain. The ability of the state to provide sufficient electricity and natural gas supply to meet future demand will continue to be a challenge. Because of this challenge, energy efficiency and other demand-side alternatives have become higher priorities and necessities, not just good virtues.

In addition, the state is concerned for the growing reliance on fossil fuels, in particular, natural gas. This has increased the State's focus on the development of new renewable energy resources.

While achieving each of these priorities is an important goal of many state agencies and the investor-owned utilities, local agencies, through concerted planning and coordinated action, can deliver significant contributions to the overall goals. The building of large power plants, gas pipelines and transmission lines is best planned and implemented at the state level. However, local implementation is the key to the success of many of the state's goals. For example, implementing energy efficiency, distributed generation and many renewables is driven by individual consumers in all sectors.

Much has been done in the region, and the development of this Regional Energy Plan is a good step in the right direction to take region's current energy successes to the next level and to better utilize the many programs that are available to assist consumers in making better decisions. The benefits are clear and compelling- significant cost reductions, enhanced energy reliability and security, diversification of fuel supplies and improving the environment. The cost savings will make a positive contribution toward retaining dollars in the economy and funding other needed local projects and services.

It is recommended that AMBAG and its member agencies take the actions outlined in Part I, Section 2, and in addition:

1. Establish a commitment to expand and continue the Energy Advisory Committee. This Committee should continue to meet on at least a semi-annual basis to monitor the implementation of the Regional Energy Plan and to increase communications on energy matters throughout the region.

2. Work toward better integrating energy planning into other local planning, including but not limited to expanding the treatment of energy in the region's General Plans (See Appendix E).

3. Work toward better use of existing local programs and resources.