SANDAG

ENERGY 2030

The San Diego Regional Energy Strategy

Prepared by

San Diego REGIONAL ENERGY OFFICE

Creating a more secure energy future for the San Diego Region

San Diego's Regional Planning Agency

ENERGY2030

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May 2003

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Acknowledgments

The Regional Energy Strategy was prepared with the advice and assistance of the Regional Energy Policy Advisory Council (REPAC) appointed by the San Diego Association of Government's Board of Directors. The REPAC voting membership and their regional designation is listed below:

- San Diego Regional Energy Office, John Moot (Chair)
- Large Business, Jim Callaghan, Qualcomm (Vice Chair)
- County of San Diego, Supervisor Diane Jacob, County of San Diego Board of Supervisors
- City of San Diego, Council Member Michael Zucchet, City of San Diego
- SANDAG North County Coastal, Council Member Jerome Stocks, City of Encinitas
- SANDAG North County Inland, Council Member Lee Thibadeau, City of San Marcos
- SANDAG South County, Council Member Mary Salas, City of Chula Vista
- SANDAG East County, Council Member Jerry Jones, City of Lemon Grove
- San Diego County Water Authority, Scott Willett
- San Diego Port District, Bill Hall
- Utility Consumers' Action Network, Michael Shames
- Small Business, Steve Zolezzi, Restaurant & Beverage Association
- Academia, Dr. Alan Sweedler, San Diego State University

The following SDREO staff participated in the Regional Energy Strategy development:

- Irene M. Stillings, Executive Director
- Kurt J. Kammerer, Director of Development
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In addition to voting members, several organizations and citizens served in an advisory capacity or provided comments to REPAC, including:

- The Sierra Club, Dan Perkins
- San Diego Gas & Electric, Bob Resley
- Association of Energy Engineers, Bob Miller
- Environmental Health Coalition, Laura Hunter
- League of Women Voters, Jodi Beebe
- Border Power Plant Working Group, Bill Powers
- Steve Hoffman
- City of San Diego- Metropolitan Wastewater Department, Tom Alspaugh
- International Brotherhood of Electrical Workers (IBEW), Local 569, Jennifer Badgley
- Ecological Life Systems Institute, Jim Bell
- Governor's Office of Planning and Research, Woody Clark
- Border Power Plant Working Group, Bill Powers
- San Diego County Air Pollution Control District, Robert Reider
- San Diego Bay Council (San Diego Baykeeper; Surfrider Foundation, San Diego Chapter; Environmental Health Coalition; San Diego Audubon Society; Sierra Club, San Diego Chapter)
- Concerned Citizen, Holly Duncan

SDREO would like to thank Steve Sachs, Senior Planner of SANDAG for his help in forming the Regional Energy Office and in developing this Regional Energy Strategy and the SANDAG Board of Directors for funding a major portion of this effort.

Much of the supporting data and content for the San Diego Regional Energy Strategy were derived from the San Diego Regional Energy Infrastructure Study (December 2002). A multi-agency team consisting of the City of San Diego, the County of San Diego, the San Diego County Water Authority, the San Diego Association of Governments, the San Diego Regional Energy Office, the Utility Consumers' Action Network and the Port of San Diego commissioned the plan. The goal of the Study was to serve as a fact-based foundation for planning San Diego region's electricity and natural gas strategies through 2030. The Study was completed by San Diego-based Science Applications International Corporation and can be found at http://www.sdenergy.org/.

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1 EXECUTIVE SUMMARY

THE REGION'S 2030 ENERGY VISION

The San Diego Regional Comprehensive Plan (RCP) suggests that we "must plan for our future differently than we have our past." The addition of over 1 million residents in San Diego and 2 million in Baja California, Mexico by 2030 will strain our infrastructure and threaten our resources. The quality of life in San Diego can only be preserved if we plan wisely and act responsibly. The RCP will contain an integrated set of public policies, strategies and action plans to promote a smarter, more sustainable growth for the San Diego region. The Regional Energy Strategy is an important and integral part of this effort.

A shared vision is essential for our region as we deal with the energy challenges facing us. Our vision is a realistic, credible, attractive energy future for our region. From this flow our goals and strategies. The following is a broad vision of how energy will be produced and consumed in our region in 2030:

- The citizens of San Diego will be more efficient consumers of energy in 2030. They will use smart, efficient technologies to manage the use of electricity and natural gas at home and at work. Despite an increase in electronic devices the amount of energy consumed per citizen will be significantly reduced.

- Use of more efficient technologies and the development of a more balanced energy supply will result in lower use and lower life-cycle costs of energy production with a lower environmental impact. Emissions will be reduced and air will be cleaner.

- Power production will be a mix of centralized and distributed generation resources. Renewable resources such as solar, wind and biomass and non-renewable resources such as fuel cells and other distributed generation technologies will comprise a much larger and more significant portion of the region's resource base. Efficient natural gas-fired plants located on both sides of the border will meet the region's remaining base load.

- A portion of the region's electricity supply will be imported. Multiple transmission interconnects to Mexico, Arizona and to the North will serve the region.

- Pipelines linking the region to large gas basins in the West will continue to serve the region's natural gas demand. Liquefied Natural Gas (LNG) facilities may provide a portion of the regions gas demand[1].

- Individual customers will have the option to arrange for their own supplies of natural gas and electricity or to participate in bundled, aggregated supply pools. Energy

[1] Whether these facilities will actually be built and can be counted on is not certain and there are concerns that LNG could increase our dependence on foreign energy sources, increasing our exposure to supply and price volatility. Additional concerns include continued industrialization and environmental justice issues to the concentration of these facilities in Baja California.

costs will reflect the cost to serve the individual customer classes while being low enough to encourage and support economic development and the creation and retention of jobs.

REGIONAL ENERGY STRATEGY OBJECTIVES

The Strategy will:

- Provide an integrated approach to meeting the energy needs and supporting future prosperity of the San Diego Region.
- Ensure that adequate supplies of electricity, natural gas and transportation fuels are available to meet the Region's needs and that those supplies are reliable and competitively priced.
- Ensure fair distribution of energy costs, balancing the diverse needs, cost causation and usage characteristics of all customer classes.
- Create an enduring framework for regional energy planning and implementation that incorporates the diverse interests and capabilities of key stakeholders in the region.
- Strongly encourage the development of clean, safe energy and environmentally benign resources.
- Look forward toward preparing the region for the potential transition from a fossil-fuel economy to new supply sources and technologies.

GUIDING PRINCIPLES

The following are the guiding principles of the Region's Energy Strategy:

- The supply portfolio will be diversified, cost efficient, environmentally sound, self sustaining, secure and reliable.
- The planning process will be open and inclusive.
- Energy projects, programs and policies will protect the interests of the vulnerable and disadvantaged communities in the San Diego region and Mexico.
- The region will have adequate indigenous resources to ensure reliability and stabilize prices.
- Energy efficiency and demand management programs will be preferred over the development of new fossil-fueled generation resources.
- Future development and land-use planning decisions will reflect progressive standards for energy efficiency and responsible energy supply.
- Energy programs and policies will support economic development activities and the creation of new jobs in the San Diego Region.

- Public awareness and education programs will promote responsible energy decisions by the public.

- San Diego and Baja California, Mexico are an inseparable economic and environmental region, requiring close coordination of energy planning and action. Recognizing this union of economy and environment, energy generated outside of the San Diego region and imported for us in the region should be encouraged to comply with both California and United States environmental labor law. Likewise, energy projects located in San Diego should take into account potential environmental effects in nearby Baja California.

- Markets and regulation must be designed and adapted as necessary to maximize the benefits of competition in wholesale markets while protecting the public from inappropriate pricing practices in retail markets.

- All energy usage affects the environment. Any energy policy or program must balance benefits and costs against the impact on the environment.

- Energy is an essential social need. All energy policies and programs must consider environmental justice impacts by ensuring the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income.

REGIONAL ENERGY STRATEGY GOALS

The following summary list of the goals set forth by the Regional Energy Strategy are public policy goals driven by its stated vision and objectives. Chapter 4 contains further detail on each goal and on the implementation steps necessary to meet these goals.

1. Public Policy

- GOAL 1: Achieve and represent regional consensus on energy issues at the state and federal levels.

2. Electricity Supply And Infrastructure Capacity

- GOAL 2: Achieve and maintain capacity to generate 65% of summer peak demand with in-county generation by 2010 and 75% by 2020.
- GOAL 3A: Increase the total electricity supply from renewable resources to 15% by 2010 (~740 MW), 25% by 2020 (~1,520 MW) and 40% by 2030 (~2,965 MW).
- GOAL 3B: Of these renewable resources, achieve 50% of total renewable resources from resources located within the County (~370 MW by 2010, ~760 MW by 2020, and ~1,483 MW by 2030).

- GOAL 4: Increase the total contribution of clean[2] distributed generation resources (non-renewable) to 12% of peak demand by 2010 (~590 MW), 18% by 2020 (~1,100 MW) and 30% (~2,225 MW) by 2030.
- GOAL 5: Increase the transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and low-cost supply.

3. Electricity Demand

- GOAL 6: Reduce per capita electricity peak demand and per capita electricity consumption back to 1980 levels.

4. Natural Gas Supply, Infrastructure Capacity and Costs

- GOAL 7: Develop policies to insure an adequate, secure and reasonably priced supply of natural gas to the region.
- GOAL 8: Reduce regional natural gas per capita consumption by the following targets: 5% by 2010 (70 MM therms), 10% by 2020 (190 MM therms), 15% by 2030 (387 MM therms).

5. Transportation Energy Supply and Demand

- GOAL 9: Complete a transportation energy study by June 2004 to evaluate the potential savings through more efficient use of transportation technology and fuels.

[2] Clean distributed generation resources refer to all non-renewable distributed generation applications that meet the CA PUC Code 218.5 and other relevant APCD requirements.

2 INTRODUCTION

WHY WE NEED A REGIONAL ENERGY STRATEGY

A major premise of San Diego's Regional Comprehensive Plan[3] is that "we must plan for our future differently than we have our past." This is particularly true in the energy sector. Good examples of why this is necessary surround us today, including the significant challenges in siting new transmission lines, the difficulty in advancing power plant projects, and a growing dependence on a single fuel source (natural gas) for almost all of our new electricity sources. One of the key conclusions of the recent energy crisis was that long-term planning and implementation strategies are more important than ever. Because energy infrastructure takes decades to build and has a useful life of 40 to 50 years, long-term planning is critical. Additionally, the problematic de-regulation of the electric power generation industry has caused the region to be heavily reliant on an unpredictable market to build and deliver energy supply resources, such as generation and renewables.

The high price the region is paying for energy as a result of the recent energy crisis has reminded us all that energy is truly the lifeblood of the region's economy. When energy is plentiful and inexpensive, economies thrive and prosper. When energy is in short supply, or when markets are disrupted or during periods of regulatory uncertainty, the resulting impacts of high prices can be significant. An abundant, competitively priced energy supply is essential to fuel the region's burgeoning economy.

Since 1999, rising electricity and natural gas costs have significantly increased the region's high cost of living and doing business. Consumers of San Diego County spend over $3.3 billion per year on electricity and natural gas. Although this is only 3.4% of the $97 billion personal income for the region[4], it is still a sizeable expenditure. As a result of the challenges of the last several years the region is spending over $1 billion more per year for electricity and natural gas than it was spending in 1999. Through 2006, the estimated additional costs of electricity and natural gas for San Diego compared to historical prices are estimated to be more than $7.5 billion.

The Region relies on imported energy to meet its energy demand. Some believe this reliance on imported energy results in lower prices, hedges against uncertainty in cost and availability of local generation and adds to reliability by providing access to a multitude of generating resources throughout the west. The recent energy crisis, however, indicates that prices can be volatile, demand can exceed supply, the market can be manipulated and that there is considerable cash drain from the region to out-of-state suppliers.

[3] http://www.sandag.org/index.asp?projectid=1&fuseaction=projects.detail

[4] U.S. Department of Commerce, Bureau of Economic Analysis.

According to the recently completed Regional Energy Infrastructure Study[5], the critical energy challenges facing the San Diego region include:

- The prospect of continued higher prices for electricity and natural gas for the next decade;
- Growing demand for energy;
- Highly uncertain market and regulatory design; and
- An aging, inadequate infrastructure for electric generation and transmission, and natural gas transmission.

Much of the regulation and policy that affects the San Diego region is created by agencies outside of the region. The California Legislature, California Public Utilities Commission, Federal Energy Regulatory Commission create broad policies that do not always consider the regions unique needs and resources. Public policy decisions can have a disproportionately negative affect on the region, without adequate representation in the process. A regional energy strategy can serve as a mechanism to achieve consensus on key energy issues and to actively and effectively participate in the state and federal energy arena.

HOW THE REGION FORMULATES ENERGY POLICIES AND PLANS

The San Diego region completed its last Regional Energy Plan In 1994. As part of that Plan, the 35-member Regional Energy Advisory Committee recommended the formation of the SDREO as a mechanism to help governments and businesses "bring about the benefits to the region that are identified in the Regional Energy Plan." In October 1995, SDREO was formed through a Memorandum of Understanding (MOU) between the San Diego Association of Governments (SANDAG), San Diego Gas & Electric (SDG&E), and the San Diego University State University Foundation. The primary goal of the MOU was to create a entity to be San Diego's regional energy planning organization and implement the REP by conducting ongoing energy policy and planning activities, building regional consensus on energy issues, managing energy programs and serving as a clearinghouse for energy information. SDREO became fully operational in late-1998, though never received the funding or authority to fulfill that mission.

[5] The San Diego Regional Energy Infrastructure Study was commissioned by a multi-agency team consisting of the City of San Diego, the County of San Diego, the San Diego County Water Authority, the San Diego Association of Governments, the San Diego Regional Energy Office, the Utility Consumers' Action Network and the Port of San Diego. The study was completed to fill a need at the time for long-term, integrated energy planning. The goal of the Study was to develop a fact-based foundation for assessing San Diego region's electricity and natural gas needs through 2030. The Study was completed by San Diego-based Science Applications International Corporation and can be found at http://www.sdenergy.org/.

Within the region, SANDAG serves as a forum for decision-making on regional issues such as growth, transportation, land use and housing, the economy, the environment, and criminal justice. It relies on the SDREO for technical and planning advice in the energy area. SANDAG is governed by a Board of Directors composed of mayors, council members, and supervisors from each of the San Diego region's 19 local governments.

DEVELOPING THE 2030 REGIONAL ENERGY STRATEGY

SANDAG contracted with the SDREO to update the 1994 San Diego Regional Energy Plan. SDREO, in partnership with several public agencies and non-governmental associations, conducted a study of the region's existing and future energy needs (REIS). This study became the factual basis on which a new Regional Energy Strategy (RES) would be based. SDREO formed the Regional Energy Policy Advisory Council (REPAC), a diverse group of regional stakeholders who advise and assist the SDREO in developing a comprehensive RES. Once agreed to within REPAC, the Regional Energy Strategy 2030 was brought to the SANDAG Regional Planning Committee, then to the SANDAG Board of Directors for formal adoption as an integral element of the San Diego Association of Government's Regional Comprehensive Plan (RCP).[6]

REGIONAL ENERGY INFRASTRUCTURE STUDY

AB 1890 and the deregulation of the California electricity industry removed investor owned utilities from long term resource planning. After the energy crisis of 2000-2001, regional leaders realized there was a strong need for long-term energy information, analysis and planning. A coalition of local public agencies and non-governmental organizations commissioned the San Diego Regional Energy Infrastructure Study (REIS) to provide the necessary information to evaluate options and make choices for meeting future energy supply and demand of the region. The goal of the REIS was to develop a fact-based foundation for assessing San Diego region's electricity and natural gas needs through 2030 and to provide a basis for long-term energy planning.

The study identified alternative resource development approaches to achieving the region's energy vision and limiting the future risks that exist. The REIS provided an integrated and comprehensive inventory and evaluation of current and potential future energy supply and infrastructure required to meet the growing needs of the region through 2030. Key infrastructure and resource options include:

- Electric generation, transmission, and distribution
- Natural gas supply, transmission, and distribution
- Energy efficiency and demand response programs

[6] The Regional Comprehensive Plan (RCP) will serve as the foundation for integrating land uses, transportation systems, infrastructure needs, and public investment strategies for the San Diego region. It is currently being updated by SANDAG and this Regional Energy Strategy is an integral part of the RCP. See http://www.sandag.org/.

- Distributed generation and renewable resources.

The REIS did not address transportation energy.

The Study was directed by the San Diego Regional Energy Office (SDREO), conducted by Science Applications International Corporation (SAIC), with funding and active participation of the City of San Diego, and the County of San Diego, the Port of San Diego, the San Diego Association of Governments (SANDAG), the San Diego County Water Authority, and the Utility Consumers' Action Network (UCAN). Over 25 community groups submitted comments that were considered in the final REIS.[7]

REGIONAL ENERGY POLICY ADVISORY COUNCIL

The Regional Energy Policy Advisory Council (REPAC) is a 13-member body formed to advise the SDREO in the development of a Regional Energy Strategy. It is an advisory body that provides regional oversight and policy recommendations to SDREO for the development of the Regional Energy Strategy. REPAC is composed of representatives of public and private entities that represent a broad cross-section of consumer and business interests. REPAC met regularly from March 2002 through May 2003 to discuss energy issues and hear presentations from energy industry experts on topics such as transmission and generation planning, public agency participation in power markets, and forming joint power authorities. A list of the REPAC members is included in the Acknowledgements. REPAC meetings are open public venues. The general public and interested community groups actively participated in the REPAC meetings.

COMMUNITY INPUT

In addition to public input gathered through the REIS and REPAC meeting process, SDREO staff and REPAC members conducted one-on-one meetings with a broad range of regional stakeholders, including residential energy users, citizen interest groups, non-residential energy users, environmental groups, local governments, business representatives, economic development groups, Baja California representatives, energy service industries, transportation agencies, financial institutions, fuel and technology industries, educational institutions and the local electric/ gas utility.

COMPONENTS OF THE REGIONAL ENERGY STRATEGY

The Regional Energy Strategy addresses electricity and natural gas supply and demand. The Strategy recognizes that transportation is an important element of our energy security, and there is a need for detailed analysis of energy supply and demand for the transportation sector, which consumes over 50% of the region's energy.[8]

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[7] See http://www.sdenergy.org/planning/reis.html for the REIS public comments.

[8] This estimate is based on the 1994 San Diego Regional Energy Plan, which stated that regional transportation energy demand accounted for 53% of overall energy demand. See Regional Energy Plan, p.7.

3 REGIONAL ENERGY BACKGROUND

This chapter provides an overview of the regional energy framework in which the Strategy was developed, including demographics, regulatory structure and energy supply and demand attributes. This chapter also provides the key findings of the REIS, which provide a snapshot of the most salient energy issues facing our region.

DRIVERS OF ENERGY DEMAND AND THE NEED FOR SUPPLY: DEMOGRAPHICS

The region's population, economic development, housing and land use are the primary divers of regional energy demand.

Population

In 2000, the San Diego region had a population of 2.8 million, a 13% increase from 1990 and a 51% increase from 1980. The population is forecast to grow by 38% to over 3.8 million by 2030[9]. Population is the primary driver of increasing demand for new housing, which is a major driver of energy use.

Economy

The performance of the economy is a primary driver of energy demand due to the electricity and natural gas consumption of office buildings and industrial processes. Several factors contributed to increasing demands for electricity and natural gas in San Diego in 2002, reversing a negative trend in 2001 that was largely due to crisis conservation, the economic downturn and response to higher prices. A relatively rapid recovery of demand due to a recovery of the economy is expected to be the most significant short-term driver of changes in energy demand. For example, past years of economic recovery have seen annual electricity consumption increases of 14% (1984), 15.6% (1988), 12.6% (1990), 15.7% (1994)

San Diego-based Knight & Carver, a 32-year old boat-builder, recently retooled its operations to build new and recondition wind turbine blades for the rapidly growing wind industry. In a few short years, this rapidly growing industry has produced over 75 jobs at the firm (60 in 2003 alone), which represents over 40% of its workforce.

[9] 2030 Regionwide Forecast, SANDAG, November 2002.

and 11.6% (1997)[10], all well above the average of 2.3%. Similar increases have been seen in natural gas demand including 14.2% (1984), 33.4% (1990), 11.2% (1998 and 2000), all well above the average of 2.0%.

There is an opportunity to position San Diego's nascent energy business sector to meet the growing energy needs. There is a strong presence of innovative energy technology-related firms within the County, including Solar Turbines, SAIC, SeaWest Wind, AstroPower, Maxwell Technologies, Metallic Power, General Atomic, Cannon Power Corporation, Shell Wind Power and more. These resources and additional energy-related businesses form a solid foundation for potential economic development opportunities surrounding emerging trends, such as distributed energy, energy storage and advanced energy generation.

Housing

Employment has been growing faster than population and housing in San Diego, forcing people to live further inland and farther away from their jobs in San Diego County. This has had significant impacts on energy needs over the last 10 years. More (and larger) homes are being built inland in hotter areas that require energy-intensive air-conditioning. The region's year 2000 housing stock of 1,040,149 units is expected to increase by 33% to 1,379,644 units by 2030. [11]

Land Use

San Diego County contains a total of 2,726,407 acres, with a significant portion of military, park, and constrained acreage.[12] The remaining vacant developable acreage is approximately 500,000 acres. Forecasts predict that by 2030 most of the vacant land will be developed. As a result, the siting of significant energy infrastructure has become increasingly difficult. An example is the local opposition to the siting of the proposed Valley Rainbow Transmission Interconnect through the heavily developed Riverside County.

CURRENT ENERGY STATE

California Regulation

Much of the public policy and regulatory decisions affecting the San Diego region are made outside the region. The California Public Utilities Commission (CPUC) regulates energy issues related to supply, delivery, rates and tariffs for all SDG&E customers in San Diego County. Only the commodity costs of electricity and natural gas have been unbundled from utility and CPUC oversight. Commodity costs are not regulated and for the most part, are set by the market. Unregulated pricing of retail energy commodities was one of the primary causes of the California energy crisis. However, rates associated with the transmission and

[10] Similar increases were experienced for electricity peak demand for these years.

[11] 2030 Regionwide Forecast, SANDAG, November 2002.

[12] Preliminary 2030 Cities/County Forecast. November 2002. SANDAG.

distribution of electricity and natural gas are still set by the CPUC for investor-owned utilities, such as SDG&E.

The Federal Energy Regulatory Commission (FERC) regulates interstate transmission of gas and electricity. Because an energy utility is a natural monopoly, there will always be a need for regulation in the delivery of gas and electricity. Utility regulation can be thought of as a substitute for competitive forces in the energy industry. Regulation is a public process, and the public is encouraged to participate in it.

Historically, the large generation and transmission infrastructure projects in the San Diego region were funded and developed on a cost-basis using a fixed rate-of-return on the capital base. It was planned, constructed and maintained by SDG&E with oversight by the CPUC. However, due to fundamental changes made by AB 1890, the state's industry restructuring effort in 1996, most power plants were sold to private industry and long-term energy planning (other than transmission) was made a function of the marketplace, rather than the utilities.

The legislature and the CPUC are making moves toward re-regulating the industry. Effective January 1, 2003 state legislators and the CPUC returned SDG&E to its pre-deregulation roles for planning and acquiring the resource needed to meet customers' energy needs. The electric utilities are required to develop a 20-year resource plan. The SDG&E plans were filed on April 15, 2003[13].

There are currently many uncertainties surrounding the future of energy markets and regulation. There is no clearly defined structure. This strategy suggests a new energy supply paradigm that achieves a more balanced portfolio of supply and demand resources including distributed energy options.

Energy Infrastructure Development

San Diego's electricity and natural gas needs have grown commensurate with the fast growing economy and population throughout the late 1990s and through 2002. Despite this growth, power plant and transmission infrastructure development did not keep pace with load growth as utilities deferred infrastructure investment while anticipating industry restructuring and more recently, as the industry is struggling with battered balance sheets and tight financial markets. Historically supply reserve margins[14] were maintained at double-digit levels (generally 15%). During 2000–2001, reserve margins throughout California and the Western Electricity Coordinating Council (WECC) steadily declined such that during 2000–2001, California's margins were frequently below 5% (which triggers a Stage 2 electrical emergency), and occasionally below 1.5% (which triggers a Stage 3 emergency and creates potential for rolling blackouts).

[13] Also, legislative was introduced (SB 888) to reverse AB 1890, the legislation that restructured the industry, thereby re-regulating the electric utilities.

[14] Reserve margin is the percentage of extra generation capacity available and used by the system operator to adjust for fluctuations in load or other contingencies.

Several challenges exist to siting major infrastructure projects in San Diego including a lack of emissions offsets. In addition, there are the lack of suitable sites away from populous areas and near transmission lines, which results in increased costs and delays due to environmental concerns. Power plants are not perceived as ideal neighbors, in particular, coastal plants that restrict public access to coastal areas. Additionally, the transmission and distribution infrastructure required to support power plants create aesthetic, health and quality of life concerns with residents in the local community. Lastly, siting is more problematic for water-cooled plants than dry-cooled due to the significant impacts of power plant cooling systems on the ecosystem.

In addition, San Diego County is in an air quality non-attainment zone and all new major emission sources must be met with offsets from other sources within the county. The San Diego Air Pollution Control District requires emission offsets and limited availability of NOx emission reduction credits (ERCs) is a significant barrier to the building of new power plants. Several strategies could be used to create the needed emissions credits. These include repowering existing power plants, allowing mobile offsets to be used for stationary power plants and creating inter-border pollution offsets.

Natural Gas

The western United States, and especially California, is undergoing a significant increase in demand for natural gas as plans unfold to build several thousand megawatts of new natural gas-fired electric generating capacity. This development could overburden the ability of the region's gas delivery system to meet this new demand. There is concern about adverse consequences for existing natural gas consumers. At least three new major generating plants are being planned for San Diego County, including the Otay Mesa Power Plant in Chula Vista, the Palomar Power Plant in Escondido and the Community Power Project in the City of San Diego. SDG&E was the only utility in the state that curtailed natural gas deliveries during the crisis of 2001, due to insufficient capacity on its system. Gas supply was curtailed to the two major electric generation facilities in the county, requiring them to switch to oil to generate electricity in their facilities. The completion of the Baja Norte Pipeline, which runs parallel to San Diego County in Baja California, and other distribution pipeline upgrades have since resolved this tight supply situation.

Supply/ Demand[15]

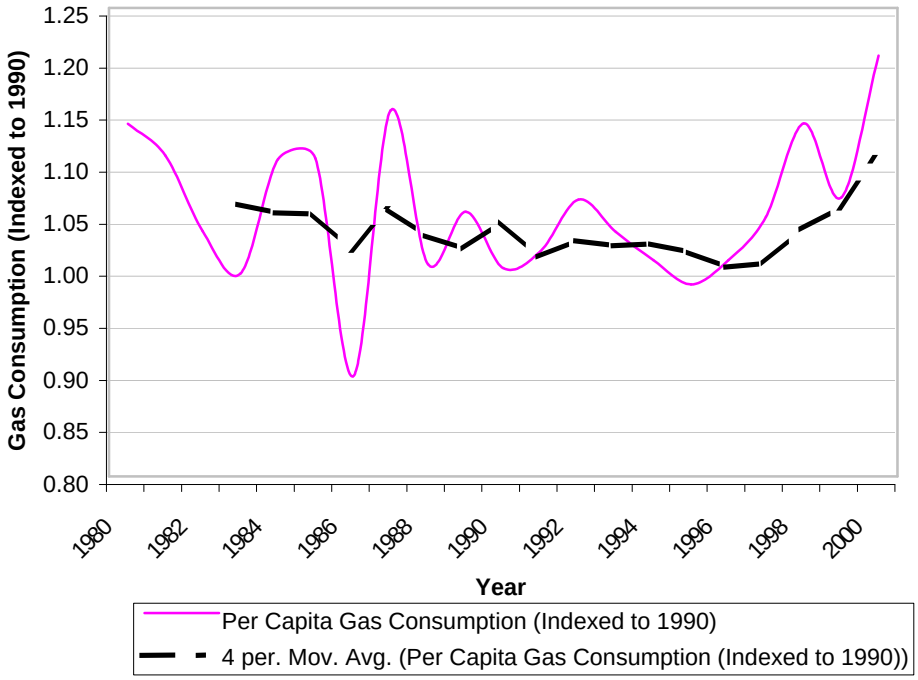
In the short term, natural gas supply is more than adequate to meet current and near-term "core" customer demand ("core" means the residential, small commercial, small industrial customers). "Non-core" supply is utilized in generation, self-cogeneration and distributed generation. Commodity and natural gas experts are projecting shortage and high pricing for natural gas in the next few years. Longer-term, growth in demand for natural gas will continue to accelerate as more power plants are built. Demand is expected to grow significantly as new natural gas-fueled power plants come online. Projected gas demand growth for electric generation (EG) in the west and the region is unclear, but may be as high as 60% of new gas growth.

[15] San Diego Regional Energy Infrastructure Study, Dec.31, 2002.

Through the mid 1990's, the region has seen a steady improvement in per capita natural gas consumption as is illustrated in Figure 3-1. This trend reversed in the last 8 years resulting in a steady increase in per capita natural gas consumption.

For the 2003 to 2006 time period, natural gas demand for the San Diego region is projected to grow by between 1.5 and 2.5% per year. However, growth rates for the region (including Baja California) will be much higher due to much higher growth rates in Baja California, which is expected to be as much as 9% per year for the next decade. Beyond 2006, average growth rates of natural gas for San Diego are expected to be about 1.2 to 1.6% per year. Availability or demand of natural gas will grow from 1,423 million therms (MMtherms) in 2002 to 2,032 MMtherms in 2030 as shown in Figure 3-2.

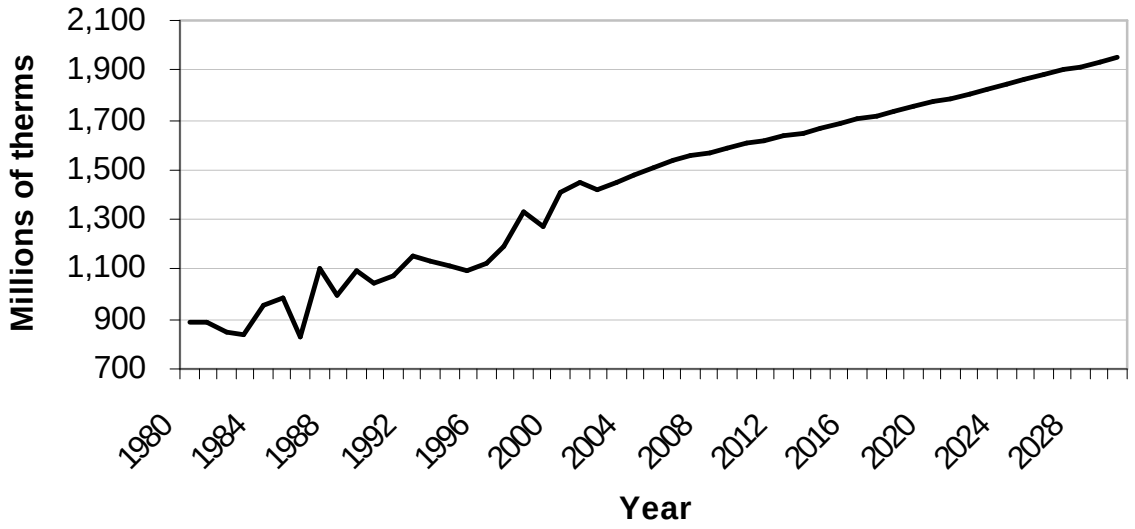
Figure 3-1: Per capita natural gas consumption (Indexed to 1990)



Expediting the re-powering or replacement of the two existing inefficient large generation plants in the region would bring about the most immediate and most significant increase in the region's gas efficiency, possibly delaying the need for natural gas capacity expansions. The South Bay Power Plant is scheduled to be replaced by a state-of-the-art plant by 2010, but there appears to be little incentive for the owners of the Cabrillo Power Plant to improve its efficiency. In any case it is possible that the short term need for natural gas could outstrip supply. There are many opportunities to implement natural gas efficiency measures, including water heater insulation blankets, commercial boiler tune-ups and replacements, solar water heating in domestic and commercial water heating systems and pool heating.

A significant risk in the long-term is adequacy of natural gas supply, particularly domestic supplies. Natural gas production in the United States will likely peak between 2015 and 2020 leaving a power generation infrastructure that is dependent on a declining national resource.

Figure 3-2: Natural Gas Consumption- Historical and Forecast



The possible construction of Liquid Natural Gas (LNG) plants in Mexico could significantly change the natural gas supply for the region. Currently, five LNG projects have been proposed for Baja California. It is highly unlikely that more than two of the five proposed plants would be built. On one hand, LNG supplies would significantly increase access to natural gas supply for the region, but on the other hand, many see LNG as increasing the risk of future price volatility and dependence on foreign fuel sources. In any case, the future development of LNG is certain to be one of the more controversial issues for the region. Another concern is the environmental justice issues with concentrating these proposed facilities in Baja California.

Delivery/ Capacity

Gas supply capacity refers to the amount of gas that can be transported through existing pipelines. The SDG&E gas system is capable of delivering 600 MMcfd in the summer and 620 MMcfd the winter. These two operating capacities include a reserve margin of 45 MMcfd to account for various potential scenarios that could affect deliverability.

There is sufficient regional natural gas transmission and distribution capacity to serve core (residential and small commercial/industrial) customers for the next 10 to 20 years. The recent completion of the Baja Norte pipeline in Mexico helped mitigate capacity constraints on the SDG&E system. Near the end of the decade, however, capacity adequacy is less certain. It appears that SDG&E is prepared to respond to the expanding needs of the distribution system in a manner that would prevent curtailments and provide firm service.

San Diego is geographically located at the very end of the transmission pipeline network that brings natural gas from several producing basins in North America. Although the San Diego

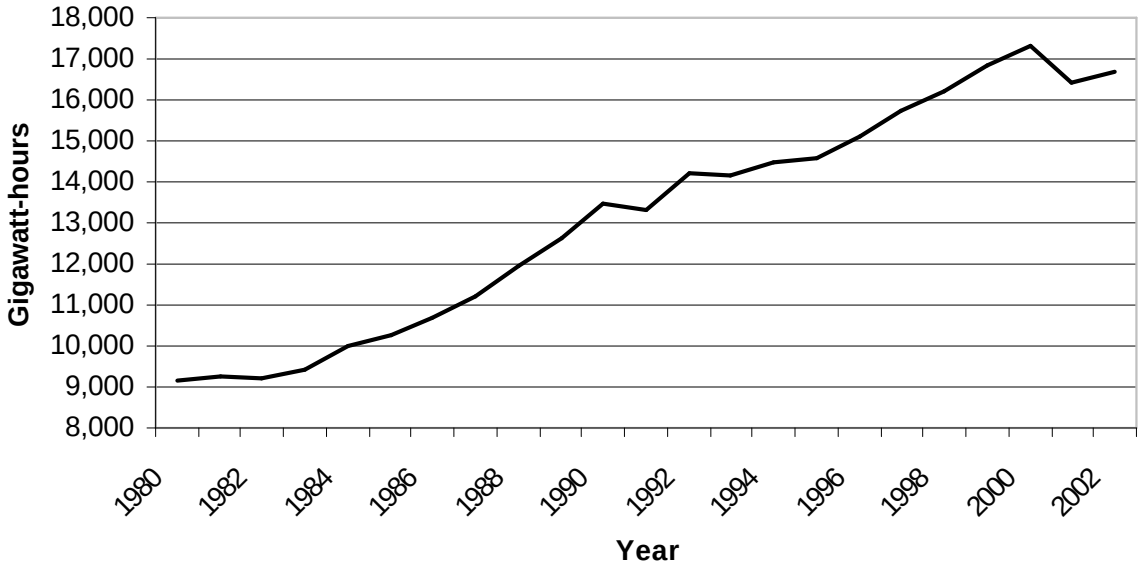
region has access to all these basins by interstate pipeline access, the final delivery into the SDG&E system is dependent on just one pipeline operated by Southern California Gas. The completion of the Baja Norte Pipeline could provide a new supply path for natural gas. The potential future access to LNG may also increase the regions natural gas supply options creating competition and likely result in a moderation of future natural gas prices for the San Diego region.

Electricity

Demand

Electricity consumption, is the total amount of electricity that is used in a given day, month or year, measured in kilowatt-hours (kWh). Peak demand is the highest amount of electricity

Figure 3-3: San Diego County Electricity Consumption 1980 through 2002



demand on the system in any given day, measured in kilowatts 9kW) or megawatts (MW = 1000 kW). The highest peak demand on the system is usually during hot summer days in late-August when air-conditioning loads are at their highest.

Figure 3-3 presents the historical annual energy consumption for the San Diego region during the 1980–2002 period. Higher prices, consumer conservation behavior and other factors such as increased use of small-scale, distributed generation caused a significant decrease in demand and consumption in 2001. This trend was reversed in 2002. Historically, electricity consumption has grown an average of 2.8% per year and peak demand has grown by 3.1% per year.

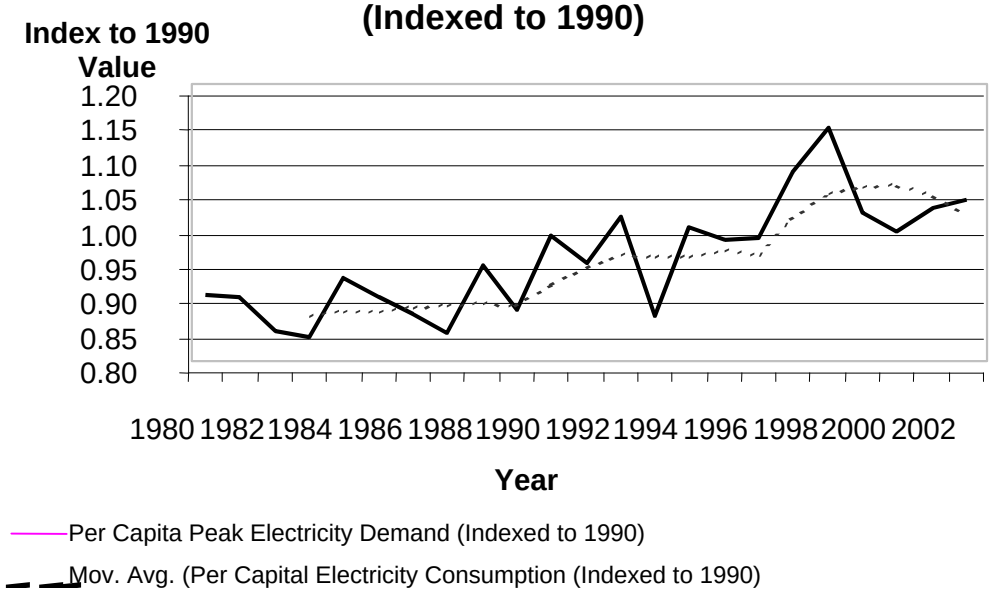
The San Diego region consumed 16,684 gigawatt-hours[16] (GWh) in 2002. County peak demand for 2002 was about 3,533 MW, up 3.4% from 2001.[17] Between 1988 and 2000, peak electric demand grew an average of 3.4% per year. Figure 3-4 illustrates per capita electricity consumption from 1980 through 2001. As can be seen, there has been a steady increase in per capita electricity consumption over the last two decades.

Current trends indicate that electricity peak demand will nearly double, increasing by more than 4,000 MW by 2030[18]. This increase in demand is the equivalent to the output of about six to seven modern generation plants. Demand forecasts in recent years are lower than in the past but since the last forecasts conducted by SDG&E in October 2001, electricity usage has rebounded significantly and it is expected that shorter-term forecasts are indeed low, having been overly influenced by the extraordinary conservation efforts of 2001.

Supply

Currently, San Diego has a total on-system generation capacity of 2,359 MWs, about 55% of the region's summer peak demand. This capacity consists of 1,683 MW of base-load plants. The remaining capacities are small and medium-sized peaking plants and on-site generators (excluding backup generation).

Figure 3-4: Per capita Peak Electricity Demand (Indexed to 1990)



[16] Approximately 6% of SDG&E's electricity demand and consumption is located in southern Orange County.

[17] SDG&E.

[18] REIS.

Bi-national Issues

The Region's proximity to Baja California, Mexico has resulted in a growing interdependency of both the supply and demand of energy. Although electric power transfers between California and Northern Baja California have taken place for over 20 years, these transfers have increased significantly in the past decade. Load growth and unprecedented power plant development along the border in Mexico will have an impact on the region's energy supply as well as a potentially significant impact on the region's environment.[19] San Diego's economic and energy development future depends on bi-national as well as interregional cooperation and joint problem solving.[20]

The region needs to recognize the valuable contribution that energy infrastructure resources in Baja California provides and work toward achieving a satisfactory contribution to its portfolio from this source—for both generation and renewable resources.

Environmental Impacts

Air Quality

San Diego County is in an air quality non-attainment zone and all new major emission sources must be met with offsets from other sources in the county. San Diego Air Pollution Control District (APCD) Rule 20.3(d)(8) requires new major stationary sources that will emit 50 tons or more per year of NOx (oxides of nitrogen) or volatile organic compounds (VOC) and modified major sources that would increase NOx or VOC emissions by 25 tons or more per year, to offset these emissions at a 1.2-to-1 ratio. The availability of NOx emission reduction credits (ERCs) to meet this requirement is limited in San Diego, which is a significant barrier to the building of new power plants. Banked ERCs can be purchased or an inter-pollutant trade of VOC ERCs is allowed by Rule 20.3(d)(5)(vi).[21]

In fact, motor vehicles are responsible for in excess of 60% of smog-forming emissions. For this reason, future emphasis on transportation energy planning will be vitally important. In addition, air pollution offsets may be made available from alternative-fueled and high efficiency vehicles for which could be utilized to site a new power plant.

Modern combined-cycle combustion turbine power plants are much more efficient and generally designed and built to be cleaner than older central steam boiler plants. New gas-

[19] 3,541 megawatts (MW) of new power plants have been recently approved in the border region and another 2,106 MW are newly online or nearing completion. In addition, nearly 80% of San Diego's growth is near the border, and electricity and natural gas growth rates in Baja California are 3 to 5 times that of San Diego. A comprehensive analysis of energy issues in the California-Baja California bi-national region with an emphasis on Baja California and Imperial County has been carried out by San Diego State University.

[20] One example of a significant interregional issue is the recently proposed Valley-Rainbow Transmission Interconnect project, which was largely opposed by neighboring Riverside County.

[21] Sempra Energy has acquired emission credits for its proposed Palomar Generation Plant in Escondido through this mechanism.

fired power plants emit significantly fewer parts per million (PPM) of NOx. Replacing or repowering old plants could have a net positive effect on regional air quality. Many peaking power plants, which are designed to offset peak demand only, are not as efficient or clean as combined cycle plants but only run during the relatively few hours of peak demand.

The air quality impacts of power plants also significantly impact public health. It has been observed that communities downwind of power plants often experienced increased rates of asthma, especially among children. For example, in the city of Chula Vista, which is located directly downwind of the South Bay Power Plant, hospitalization rates for childhood asthma are above the county average.[22]

Water Quality and Availability

Increasingly, water constraints are affecting the siting and output of power plants, particularly in arid regions like San Diego. Also, to some extent, power costs could potentially drive the supply cost of water due to pumping requirements to bring the water into San Diego County. Future new water sources, like desalination, can be very energy intensive processes[23] that favor co-location to power plant development in order to be cost-effective. There is also a concern that desalination will prolong the lifespan of outdated and inefficient once-through water-cooled plants.

This, coupled with greater resistance to locating new energy facilities on the coast, increases competition for water use. About 15,000 gallons of water per MWh is used by the new water-cooled, combined-cycle gas plants being considered for San Diego County. Central station boilers using once-through cooling require nearly twice the amount of water. Air-cooled combined-cycle plants use the least amount of water. Water discharge from plants is a major concern due to both short and long-term impacts on ecosystems.[24] Water-cooled power plants require National Pollution Discharge Elimination System (NPDES) permits to be renewed every 5 years by the Regional Water Quality Control Board. In addition, USEPA is in the process of releasing new regulations concerning 316(b), which sets water intake and discharge requirements for power plants with cooling intake structures. New technology and practices make dry cooled power production feasible. From an environmental perspective, dry cooling is considered by some to be a preferred alternative to water-cooling technology, as it does not adversely impact coastal and estuary areas. Dry cooling technology also makes it possible to site even the largest power plants in all climate zones and far away from navigable U.S. waterways. Mexico is a leader in the use of dry cooling in combined-cycle power plants. Eight dry-cooled plants, totally 3,500 MW, are operational in the country.

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[22] "Clinic has kids breathing easier, Chula Vista part of asthma study," San Diego Union –Tribune. August 22, 2002.

[23] New technologies are reducing the energy intensity of desalination processes. Capacitive deionization (CDI) with carbon-aerogel electrodes is a new process for removing salt and other impurities from water that uses far less energy than reverse osmosis systems since, it does not require the use of membranes or high-pressure pumps.

[24] Deadly Power: A Case for eliminating the impacts of the South Bay Power Plant on San Diego Bay and ensuring better environmental options for the San Diego/Tijuana Region. Environmental Health Coalition, December 2001. http://www.environmentalhealth.org/pubs-reports.html

Seven of these plants are within 150 miles of the U.S. border. Nevada now requires the use of dry cooling in new power plants. In contrast, California has only two dry cooled plants, totaling 740 MW. However, the only large inland project ever permitted by the California Energy Commission (CEC) in San Diego County, the 540 MW Otay Mesa Project, is proposed as a dry-cooled plant[25].

California Energy Commission (CEC) staff recently recommended the Commission develop and implement a policy that requires new generation to maximize water conservation measures for power plant cooling. While economic criteria will almost always favor wet cooling, it ignores the issue of protection of a limited resource. Not only would dry cooling significantly reduce facilities' water demand, but it removes a major siting constraint and ensures facility reliability during emergencies and droughts[26].

New Technologies

Much of our current energy infrastructure was built over 40 years ago. Since that time, new technologies have significantly improved the efficiency at which energy can be produced, distributed and consumed. For example, new conventional power plants being built today are nearly twice as efficient of those currently in operation in San Diego. That was not a major concern when natural gas prices are low, but increasingly inefficient power plants are being shutdown due to their lack of efficiency and economic obsolescence[27]

Security and Reliance on Foreign Energy Sources

National energy security is becoming increasingly important as a result of the terrorist attacks on September 11, 2001 and the continued tension in the Middle East. Specifically, there are concerns about the vulnerability of large energy infrastructure like nuclear power plants and natural gas hubs and other energy facilities that may be subject to sabotage.[28.] There is also growing concern over the extent of the US reliance on foreign oil and natural gas. A more independent and decentralized energy system, less reliant on central power plants and extensive transmission and distribution networks, is safer and less vulnerable to disruption. When such a system relies on renewable and indigenous fuel supplies, our dependence on

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[25] Border Power Plant Working Group's Comments on Draft San Diego Regional Energy Infrastructure Study, April 23, 2003.

[26] Adapted from California Energy Commission, Water Supply Issues Workshop Summary, June 15, 2001, pg. 17.

[27] Recently, Duke Energy shut down the 222 MW South Bay Unit 4 due to economic obsolescence, which represents nearly 10% of the region's indigenous generation.

[28] According to "Energy Security: Solutions to Protect America's Power Supply and Reduce Oil Dependence," a recently published study by the Union of Concerned Scientists (UCS), the nation's current energy infrastructure is highly exposed and makes an easy target for a well-placed attack. A disruption at a key power plant, refinery, transmission hub, or pipeline could break the flow of power or fuel to millions of customers and create costly energy price spikes or power outages, while also incurring significant economic losses and welfare losses that are not easily monetized. A major accident at a nuclear power plant could have more drastic consequences.

foreign political powers is decreased. Sustainable energy planning that guides the use and development of distributed energy, renewable resources and energy efficiency can reduce our reliance on imported fossil fuels and the centralized generation system, and thereby increase our energy independence and security.

FUTURE TRENDS

The region has tremendous opportunity to increase the utilization of its indigenous renewable resources and to define its energy destiny. As was learned from the energy crisis of 2000-2001, the region cannot afford the high cost of being reactive in ensuring a sufficient supply of energy. In response to the recent market failure in California and current industry restructuring consumers are demanding that the region have greater control over how its growing energy demand is met.. A greater range of options must be considered, including non-traditional alternatives, particularly renewables. Consumers have also become highly skeptical of the ability of the market to deliver an essential commodity like energy at a reasonable price. New generation and transmission siting must consider other options and perspectives beyond the current narrow and sometimes piecemeal considerations that are raised. The region has valuable assets of its own that could be drawn upon to help control risks and contribute to the County's resource portfolio. Many commercial and industrial customers who have existing supply resources can be drawn upon to contribute to the balanced resource portfolio.

As essential as energy efficiency and demand response programs are, we cannot "save our way to prosperity." To encourage major expansion of regional business and attract new business relocation, the energy supply must be robust, abundant, reliable and price competitive. Our Regional Energy Strategy is designed to assure the energy supply needed to support economic growth and improve the quality of life in the San Diego region.

4 REGIONAL ENERGY GOALS AND OBJECTIVES

This chapter presents the goals and primary implementation strategies for achieving the energy vision articulated in Chapter 1. These goals and strategies are presented in the following categories:

1. Public Policy
2. Electricity Supply and Infrastructure Capacity
3. Electricity Demand
4. Natural Gas Supply and Infrastructure Capacity
5. Transportation Energy

The goals in this chapter represent a broad, long-term target for the region. The implementation strategies represent the necessary action steps to reach the goal.

The goals presented in this chapter are public policy goals driven by the vision and overall objectives of the Regional Energy Strategy. In developing these goals, the practicality of achieving them given the current regulatory, economic and other barriers were considered, but not necessarily used as constraints. While some of these goals may seem aggressive and perhaps unachievable at this time, they are intended to drive other future public policy decisions (e.g. economic development focus, government subsidies, programs, etc.) that will enable them to become achievable over the timeframe of the RES.

1. PUBLIC POLICY

Regulatory and legislative policy at the state and national level will drive the majority of energy activities in the state and region during the next decade. At this time the San Diego Region has little input and almost no influence to shape these policies. Thus our future is being formed outside of our Region and outside of our control.

GOAL 1: Achieve and represent regional consensus on energy issues at the state and federal levels.

The San Diego Region consists of a number of different local government entities, including the County government, 18 municipalities, special districts, and others, many of who are represented on the Board of Directors of the San Diego Association of Governments. SANDAG does not have an Energy Committee to follow and act on energy issues. No consensus, as yet, has been achieved among the cities, the county and a variety of other stakeholders in the region as to what our vision is and how to present our vision, our needs and our solutions at regulatory and legislative proceedings. Thus the voice of the consumers of the San Diego region has not been heard as the fate of energy in our region is being decided.

UCAN intervenes, but for residential and small commercial consumers only. Individual business associations intervene for their interests. SDG&E promotes its interests. Industrial

customers represent their agenda. But, no entity exists to pull these disparate views into a regional view. One could be created.

Goal 1 Implementation Strategies

- Convene working groups to explore and discuss key energy issues.
- Develop a mechanism to track and analyze energy-related legislation and regulation that affects the region.
- Develop a process to achieve regional consensus on key energy issues.
- Identify the spokespeople to represent the entire San Diego Region in Sacramento, San Francisco and Washington, D.C.
- Conduct an annual energy summit to focus on current issues.
- Publish an energy newsletter to keep energy stakeholders updated on current affairs.
- Develop an inclusive strategy to involve all interested stakeholders in energy discussions and decisions.
- Create or identify a regional energy organization with the appropriate implementation authority[29].

2. ELECTRICITY SUPPLY AND INFRASTRUCTURE CAPACITY

In order to maintain reliable and reasonably priced electricity supply that is not subject to high levels of price volatility, the region needs access to adequate supply resources. Electricity supply can be supplied by in-region generation or transmission of resources generated outside the region.

Identifying the optimum balance of indigenous and imported resources and then maintaining that balance is very challenging. In the 1990's, the region enjoyed some of the lowest energy prices in California through a strategy of emphasizing the use of lower-cost power from out-of-state generators fueled by lower-cost fuels, such as hydro and coal. Recently, there has been a dramatic increase in the cost of these resources as demand has grown throughout the Western United States and the industry has loosened regulation of prices. There have been large additions of generation resources in regions surrounding San Diego County, but very few resources added within San Diego County. Most existing generation in San Diego is rapidly approaching its useful, economic life.[30]

Unfortunately, resources added outside the County are not necessarily in the best location to serve San Diego's needs. For example, nearly 2,100 MW of new generation will be brought online in 2003 in Baja California. However, these resources are marginally useful to San Diego, since, from a reliability standpoint, all of this supply needs to be transferred through

[29] Implementation options will be discussed in Part II of the Regional Energy Strategy.

[30] The REIS anticipated that the region may be facing significant retirements of older economically less attractive generating plants. In early 2003, Duke Energy shutdown the 222 MW South Bay Unit 4 due to economic obsolescence, which represents nearly 10% of the region's indigenous generation.

limited transmission paths into the region.[31] One option to achieve better access to this generation to improve San Diego's reliability is to upgrade the existing two Comisión Federal de Electricidad (CFE) 230 kV lines running from Mexicali to Tijuana[32], and to increase capacity of cross-border transmission lines.

Significant barriers prevent implementation of the optimum electricity supply solutions, including:

- Poor financial markets,
- Poor credit worthiness of energy developers,
- Emphasis on short-term costs that discount traditional, fossil-fueled power plants and do not adequately take into account future price risks (due to potentially constrained natural gas supplies) and the costs of environmental externalities,
- Various system constraints hinder the maximum utilization of renewables since often the best resources are furthest from the need. For example, developing wind resources in east San Diego County would require transmission upgrades.
- The disconnect of land-use planning and urban development of land resources prior to siting critical energy infrastructure creates significant barriers to building this infrastructure later (e.g. the challenges of building the Valley Rainbow Transmission Interconnect through Riverside County).

If this trend of reliance on imports were to continue, the region could become much too reliant on transmission imports[33]. To achieve and maintain an appropriate balance of imported versus indigenous generation, we should encourage and select an energy resource portfolio that considers cost, environmental performance and reliability factors. In the past, the region has received less than one percent of its electricity supply from renewables.[34]

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[31] There are three major power plants being built in Baja California: the 750-MW Intergen plant (the La Rosita Power Project or LRPP), the 310-MW La Rosita Expansion Project ("LRES") and the 600-MW Sempra Energy Resources plant in Mexicali (Mexico). Generation in this region flows through the Southwest Power Link (SWPL), into the region through the Miguel Substation. The transmission system designed criteria assume that this link is lost, therefore none of this capacity adds to the regions overall reliability.

[32] This project is currently being considered in a Joint US/Mexico Border Joint Transmission System Study. F. Aboytes, *CFE Generation and Transmission Expansion Plan – Baja California System*, presented at California ISO System Transmission Expansion Planning (STEP) workshop, San Diego, California, March 2003.

[33] According to the REIS, capacity of indigenous generation to meet our summer needs was 55% in 2002, and may dip to 44% by 2010, 36% by 2020 and as low as 29% by 2030.

[34] SDG&E recently procured nearly 7% of San Diego supply from renewable resources in response to the State of California Renewable Portfolio Standard, imposed by AB 57, which requires utilities to procure enough renewables to achieve 20% by 2017.

Combining the plentiful solar resources of San Diego with the geothermal[35] and wind resources[36] nearby to the east and the south, the region should be able to achieve increased use of renewable resources with little difficulty. For this reason, a preference toward clean energy options should become policy.[37]

In summary, the region should seek to develop a balanced portfolio of energy supply resources, with consideration of the following development policies:

- For electric generation, an appropriate level of in-region vs. imported resources;
- For electric contract supply, an appropriate balance of long-term vs. short-term supply contracts;
- For both generation and contracted supply, an appropriate level of fuel diversity (including renewables) to meet or exceed required standards;
- The appropriate use of new and emerging technologies, including distributed generation (e.g. combined heat and power);
- Maximizing overall electricity grid system efficiency[38] and environmental performance;
- Minimize energy cost as much as possible within the framework of a balanced portfolio;
- Appropriate valuation of the costs and benefits of various approaches, including costs of externalities, such as environmental impacts and/or;
- A targeted level of demand response resources.

Following are the goals and proposed action steps for the region to achieve the overall strategy of a more balanced Electricity Supply and Infrastructure Capacity.

[35] Although not available in San Diego County, geothermal resources are estimated to increase by up to 400 MW by 2030 in Imperial County and Baja California.

[36] Wind energy potential in excess of 500 MW is possible by 2030, more if development includes resources in Baja California and east and north of San Diego County are considered.

[37] New generation in San Diego must meet rigorous standards for emissions, in particular, for emissions of oxides of nitrogen (NOx), the precursor of ozone and smog. Offsets must be obtained in order to build a generation plant that will emit more than 50 tons of NOx. Offsets in San Diego are significantly more expensive then in the majority of the non-attainment regions in the United States, being valued at the equivalent of $10,740 per ton-year in 2002. Generation outside the United States, such as in Baja California, are not required to offset for emissions and environmental impacts.

[38] For example, improving the efficiency of the distribution system by placing the generation at locations in the overall grid where they would best supply the peak demands of consumers, thereby decreasing the need for capital improvements on the distribution system and significantly reducing supply line losses.

Goal 2: Achieve and maintain capacity to generate 65% of summer peak demand[39] with in-county generation[40] by 2010 and 75% by 2030.

Basis

This goal is defined by a ratio of the total generation capacity located in the County (including all types and sizes of generation, such as base load, peaking, distributed generation and renewables) to the total estimate[41] of San Diego County electricity capacity requirements (including a 15% reserve margin). Achieving this goal would return the region to in-County total generation levels that existed prior to 1990. The 2002 level of in-County generation capacity was approximately 58% and based on retirements of existing plants (and the construction of no new generation), this capacity is projected to fall to as low as 29% by 2010 and 10% by 2020 (See data Table in Appendix A for projected peak demand for San Diego County).

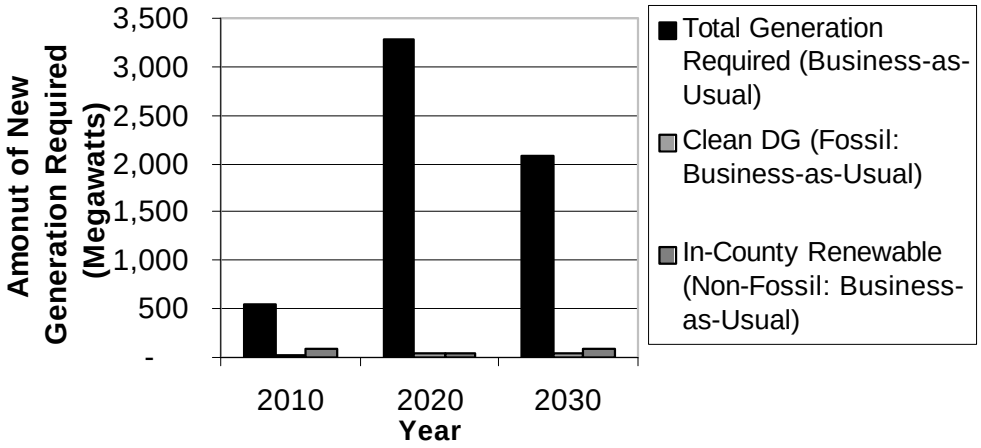
Figure 4-1 shows the amount of incremental new generating capacity required to achieve this goal by year 2010, 2020 and 2030. Also shown is the anticipated contribution of distributed generation, demand reduction and in-County renewables based on based on a business-as-usual approach (using current growth rates). Included in the total requirement are replacement or repowering of the existing base load generating plants, new base load plant additions, distributed generation and renewables. (Goals and impacts for distributed generation and renewables will be discussed later in this Chapter).

[39] 90/10 summer peak demand for San Diego County only (estimated as 94% of SDG&E total demand) plus a 15% reserve margin required for reliability.

[40] In-county generation includes all type generation, including base load power plants, peaker plants, distributed generation and renewables, regardless of size.

[41] Estimated to be 94% of SDG&E's total capacity requirements. The remaining 6% serves SDG&E customers in Southern Orange County.

Figure 4-1: Amount of New Generation Capacity Required to Reach Goal (Business-as-Usual for Alternatives)



Rationale

Increasing the amount of in-County generation is in response to the public policy objective of achieving a higher level of control and self-sufficiency in electricity resources. The goal promotes reversing the trend of the last two decades of "renting" versus "buying" our electricity resources. While there are benefits to this approach, tradeoffs are inevitable, including:

- In-county generation creates jobs.
- In-county generation keeps revenues that are generated by electricity sales in the region. For example, every 10% of in-County generation capacity generates an estimated $255M in capacity and energy revenues (in annual 2003 dollars). This number increases to over $1 billion per year by 2030 (2003 dollars). If in-county generation is owned and controlled by local entities, it would keep more revenues in the local economy as well as provide a higher level of insurance against future supply scarcity and price volatility.
- In-County generation can reduce or eliminate costs of maintaining reliability through California Independent System Operator (CA ISO) reliability must-run contracts[42].
- Excess power generated by in-County generation can be exported to neighboring regions if sufficient transmission export capacity exists.

[42] RMR units are units the CA ISO determines need to have contracted so it is able to dispatch in order to maintain grid reliability. For 2003, San Diego has 1,627 MW of RMR contracts with generation providers. The cost of these RMR contracts to SDG&E ratepayers in 2003 alone is expected to be $83.5 million and is expected to grow in future years). (Source: Direct Testimony Of David M. Korinek, SDG&E. Order Instituting Rulemaking to Establish Policies and Cost Recovery Mechanisms for Generation Procurement and Renewable Resource Development. April 15, 2003).

[43] Total NOx emissions for generation was approximately 2.6% of County sources in 2000.

- In-county generation brings emissions into the county, however emissions from power plant sources are very small compared to overall emissions[43].

Goal 2 Implementation Strategies

- Repower, retire or replace existing older, inefficient regional power plants. Replacement or re-powered plants should employ state-of-the-art technologies (such as dry-cooling) to minimize impacts on the environment, water resources and public health.
- Construct sufficient new efficient, clean power plant(s) that employ state-of-the-art technologies (such as dry-cooling) to minimize impacts on the environment, water resources and public health[44].
- Develop a process to identify and, if necessary, zone appropriate land for future energy infrastructure.
- To the greatest extent possible, utilize local workers, contractors, training programs and manufacturers to support building a sustainable local energy economy.
- Partner with existing training programs and community outreach groups to train the next generation of the region's energy workforce and energy decision makers. for future energy infrastructure construction

Goal 3A: Increase the total electricity supply from renewable resources to 15% by 2010 (~740 MW), 25% by 2020 (~1,520 MW) and 40% by 2030 (~2,965 MW).

Basis

This goal is defined by the ratio of the total amount of renewable energy capacity (in MW), including all in-County and all imported renewable energy that supplies regional needs, to the maximum summer peak demand (in MW) of San Diego County.

The amount of renewable energy from in-County supplies in 2002 was 25.1 MW, or less than 1%. In 2002, legislation was enacted to create a Renewable Portfolio Standard (RPS). The RPS requires all investor-owned utilities in California to provide by 2017 20% of their overall electric supply with energy supplied by renewable energy resources, including wind, solar and geothermal.[45] In late-2002, SDG&E procured approximately 237 MW of renewables, which will boost overall renewables to about 7% in 2003[46].

[44] See addition discussion on page 18.

[45] See AB 57 at www.leginfo.ca.gov.

[46] Only 10% of the renewables contracted for by SDG&E in 2002 were in-County.

In the last 3 years, there has been a dramatic increase in the use of solar technologies as a result of increased consumer awareness, consumer response to high electricity prices, and enhanced incentives[47]. Late in 2002, SDG&E procured approximately 237 MW of renewables (including wind, landfill gas and biomass), which increased total regional energy supplies from under 1% to approximately 7%. The targets of Goal 3A above are based on the goals established in the renewable portfolio standard. But they go further by achieving the RPS requirements sooner than 2017, and then continuing to increase the use of renewables to achieve double the RPS standard by 2030.

Figure 4-2: Total Renewables (RES vs. Business-as-usual)

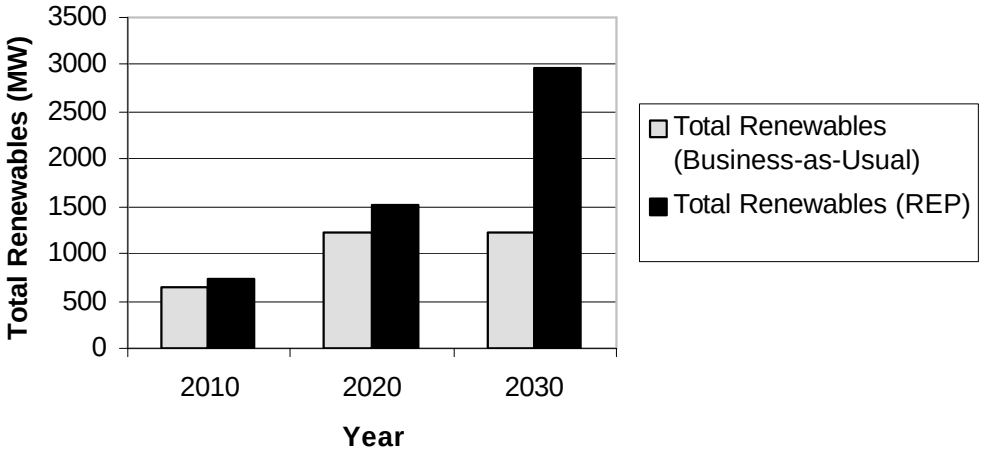


Figure 4-2 illustrates the amount of total renewables that would be required by 2010, 2020, and 2030 respectively, to achieve this goal. The illustration compares the goal to the business-as-usual case, which (for the purposes of this illustration) represents the County achieving the RPS standard by 2020. Installation of renewable energy in the region, particularly photovoltaic, has grown rapidly since the institution of net metering.[48] This trend is likely to continue into the future, therefore contributing significant amounts of distributed renewables in the region. In addition, according to the REIS, there is significant wind potential in the Laguna Mountains in eastern San Diego County and along the border with

[47] Such as the Self-Generation Program, which is administered by SDREO. See http://www.sdenergy.org/selfgen/

[48] Net metering allows customers whose renewable energy generation system produces more power than is need at any given time to be fed back onto the utility's transmission and distribution system. The utility is required to provide a credit for this energy equal to the retail rate, or the rate the customer would have paid for electricity during this time. Net metering is limited to 0.5% of a utility's overall peak demand, roughly 18.7 MW in the SDG&E territory.

Mexico. Future east-west transmission line upgrades could provide an opportunity for more renewable energy supplies[49]. REIS also stated that significant geothermal potential exists in regions surrounding San Diego County. Ability to draw resources from those sources could allow the region's renewable contribution to rise substantially.

Rationale

One of the key findings of the REIS was a lack of fuel source diversity in the regional energy supply. Currently, more than 80% of our in-County electric generation is provided by combustion of natural gas[50]. Increasing consumption of renewable energy in the region will help to diversify the region's energy supply. Increasing the amount of renewable supplies can help to insulate the region against potential price volatility in the natural gas market.

Goal 3B: Of these renewable resources, achieve 50% of total renewable resources from resources located within the County (~370 MW by 2010, ~760 MW by 2020, and ~ 1,483 MW by 2030).

Basis

This sub-goal is measured by the percentage of the total amount of renewable energy (in MW) supplying the region. This encompasses all in-region renewable energy supplies and all imported renewable energy that is produced within San Diego County, including large-scale plants and on-site distributed renewable resources.

The amount of in-County renewables in 2002 was 25.1 MW, or less than 1%. In late-2002, SDG&E procured approximately 237 MW of renewables. Approximately 26 MW of these renewables were in-County.

Rationale

Increasing the percentage of electric energy supplied by renewable resources can help to diversify the regional fuel mix. There are many other potential benefits of renewable energy generation, including air quality and economic development. But the benefits may not accrue to San Diego County if the sources are not located in the region. Pursuing Goal 2 – to increase in-region electricity generation capacity – could have a negative effect on the region's air quality if it is all derived from fossil-fuels. Increasing in-region renewable energy generation can help achieve higher regional power generation capacity without increasing regional air emissions levels. Increasing in-region renewable energy generation also can create jobs and help keep energy dollars in the regional economy.

[49] Recent legislation and CPUC orders have placed a priority on identifying and building transmission corridors that promote better access to renewable resources.

[50] The remaining portion is 1% renewables, and 19% nuclear. Energy resources for all of SDG&E's supply sold to consumers (including supply contracted from outside the region) is composed of Natural Gas (50%); Nuclear (16%); Renewables (12%); Coal (11%); Large Hydroelectric (10%) and Other (<1%). Source: SDG&E Power Content Label.

Goal 3A and 3B Implementation Strategies

- Develop a regional renewable energy development initiative to assist and promote the availability of renewable energy systems for public agencies, commercial and industrial customers and residential consumers.
- Create a coalition of community-based organizations to jointly fund a regional penetration, feasibility, and placement study for renewables in the region.
- Evaluate opportunities for public-private ventures to develop large-scale renewable projects within the region to serve the needs of the region's renewable energy supply goals.
- Develop remaining opportunities to tap local landfill gas resources.
- Organize a corporate pledge program to support a strong commitment to regional renewables development and use.
- Develop financing mechanisms to address the upfront capital costs of energy supply systems, such as solar electric systems.
- Support changes to the newly enacted Renewable Portfolio Standard to allow accelerated credit for on-site renewable energy generation.
- Support the removal of the current cap on the total capacity of renewable energy system that can take advantage of net metering (0.5% of peak demand or 18.7 MW).
- Promote quality jobs for workers employed in the energy sector through the invigoration of the local renewable energy industries.
- Develop incentives for increased levels of research and development in the region for new emerging technologies.
- Develop a bi-national renewable energy development plan with Baja California to develop the sizable potential of solar, wind, and geothermal energy generation in Northern Baja.
- Encourage credits in the Title 24 Energy Code for zero emission on-site energy production.

Goal 4: Increase the total contribution of clean[51] distributed generation resources (non-renewable) to 12% of peak demand by 2010 (~590 MW), 18% by 2020 (~1,100 MW) and 30% (~2,225 MW) by 2030.

Basis

This goal is measured by the percentage of regional peak demand served by clean, non-renewable distributed generation resources, such as combined heat and power. Currently, 3.5% of the region's peak demand is served by on-site, small scale, non-renewable distributed generation.

[51] Clean distributed generation resources refers to all non-renewable distributed generation applications that meet the CA PUC Code 218.5 and other relevant APCD requirements.

The amount of in-County clean distributed generation in 2002 was approximately 150 MW, or approximately 4% of total supply.

Rationale

Locating power generation technology at or near the load has numerous benefits, including increasing the overall efficiency of the distribution grid. In addition, increased use of distributed generation technologies can improve overall system reliability and security.

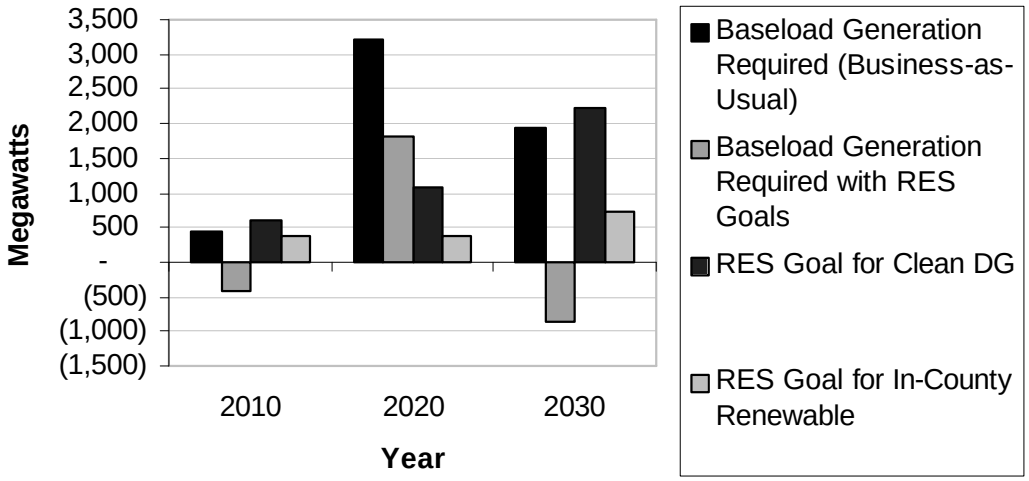
Goal 4 Implementation Strategies

- Support regulatory changes that permit customers to use excess power production by distributed generation to offset energy usage of other accounts (wheeling).
- Support the removal of regulatory barriers to self-generation, such as standby charges and exit fees.
- Develop programs and processes to promote the use of distributed generation resources. In particular, support the continuation of the Self-Generation Incentive Program with funding for all categories of distributed generation technologies.
- Develop and implement standardized and streamlined permitting processes for all distributed generation technologies in all regional permitting agencies.
- Develop a distributed generation economic development program to attract producers and suppliers of distributed generation.
- Develop a regional distributed generation education campaign.
- Maximize use of state-funded and authorized incentive and financing programs.
- Aggregate distributed generation equipment purchases where feasible.
- Encourage statewide working group to develop a long-term deployment strategy for distributed generation technologies.
- Encourage a regional or statewide aggregate level dispatchable power program and/or market that reward participants while offering greater system reliability.
- Promote innovative research and development of energy technologies that would improve energy, environmental performance, fuel diversity and the local economy.

Figure 4-3 illustrates the impact of Goals 3B and 4 on the amount of base load[52] generation required in the County in future years.

[52] For the purposes of this illustration, baseload power plants are all non-renewable power plants that are not included in the definition of DG and renewables, including large power plants and peaking plants.

Figure 4-3: Required Generation With RES Alternatives



Goal 5: Increase the transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and competitively priced supply.

Basis and Rationale

The transmission grid provides for a number of functions, including providing access to out of region power, improving fuel diversity (in particular, renewables), providing access to broader supplies in the market that help lower and stabilize electric prices, improving system stability and reliability, and creating opportunities for local generation to sell to markets outside San Diego. These benefits need to be balanced with the fact that siting issues for new transmission lines are often contentious and difficult to achieve due to the large number of parties that are affected by such projects (e.g. visual impacts, potential impacts on property values, concerns for the impacts of electric and magnetic fields (EMF).

Goal 5 Implementation Strategies

- Pursue viable options for an additional high-voltage transmission interconnection to the region to improve reliability. Identify a project as soon as possible and complete construction by 2008.
- Complete the necessary upgrades to the transmission system to improve reliability and access to new generation in Baja California as well as interconnections with renewable energy development in Imperial County and Eastern San Diego County.
- Actively participate in established regulatory forums to encourage an energy infrastructure planning process that is transparent and more accessible to the public.

- Conduct specific transmission infrastructure studies to evaluate, improve, and ensure system reliability.
- Continue to work with the California Independent System Operator[53], SDG&E, and surrounding states (including Baja California) to evaluate all alternatives for improving transmission supply into the region.
- Complete a long-term study to evaluate the need for and identify potential sites and corridors for future energy infrastructure projects with an emphasis on transmission that would enable better access to renewable generation sites.
- Develop a process to identify and, if necessary, zone appropriate land for future energy infrastructure to avoid conflict of needed energy infrastructure with future development.

3. ELECTRICITY DEMAND

Energy efficiency, demand response, distributed generation and renewables offer a significant hedge to volatile and rising energy prices and contribute to achieving energy diversity. A substantial amount of cost-effective electricity energy and demand reduction savings is possible as has been shown by successful energy efficiency programs in the last few decades.

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.

Reducing electric demand through conservation, energy efficiency, and demand response activities are the first actions that should be taken by the region. Such demand-side measures can be considered a most reliable "supply resource" option and have been consistently shown to be the easiest to achieve. Demand reduction delays the need for the construction of new generation and new transmission. Demand reduction reduces the output requirements placed on in-region power plants, thus improving air quality and community health.

The next level of focus is on cost-effective renewables and distributed generation. The potential of solar thermal water heating, photovoltaic generation, wind power, geothermal, ocean power, and biomass has not been fully explored. As the technology for renewable generation becomes more effective and installation costs decline, these resources will become a much larger portion of reducing the demand for base load generation.

[53] The California Independent System Operator (CAISO) is responsible for reliable operation of the transmission grid consistent with of planning and operating reserve criteria no less stringent than those established by the Western Electricity Coordinating Council (WECC) and the North American Electric Reliability Council (NERC).

Goal 6: Reduce per capita electricity peak demand and per capita[54] electricity consumption by the following targets:

	1980	1990	2000	2002	2010	2020	2030
Per Capita Electricity Peak Demand	0.91	1.00	1.14	1.07	1.00 4% Reduction	0.94 9% Reduction	0.91 14% Reduction
Target MW Reduction[55]					515	1,742	3,556
Per Capita Electricity Consumption	0.91	1.00	1.14	1.07	1.00 5% Reduction	0.94 10% Reduction	0.91 15% Reduction
Target GWh Reduction[56]					1,987	6,289	12,548

Basis

Per Capita Electricity Peak Demand and Consumption compares historical actual demand and consumption to population, and projected demand and consumption to forecast population. Target MW and MWh Reductions are estimates based on comparing achievement of these goals to projected demand and consumption based on projected growth rates.

Since the early 1980's, per capita energy consumption has steadily increased as the community has demanded greater energy use to support its improving lifestyle and to achieve a higher-level quality of life. The basis for this goal is to reduce energy consumption, measured on a per capita basis, to 1990 levels by 2010, and to 1980 levels by 2030.

[54] Based on projected populations of 3,235,675 in 2010, 3,598,871 in 2020, and 3,889,604 in 2030 (Source: SANDAG).

[55] Assumes the Base Case REIS growth rate of 2.3% growth in electricity demand prior to savings.

[56] Assumes the Base Case REIS growth rate of 2.0% growth in electricity consumption prior to savings.

Rationale

The evolution of technology is such that significant savings are possible in appliances, new construction and in particular, existing construction. For example, the emergence of light-emitting diodes (LED) in a broad range of lighting applications could reduce lighting demand by as much as 90%. Retrofit of existing buildings to off-the-shelf technology can reduce consumption by as much as 60%. Although society is demanding more and more electric appliances, energy efficiency and smart energy devices will reduce their consumption significantly. Strategies to reduce energy used per capita should consider new technologies to the extent that they will be more efficient, environmentally benign and reduce reliance on fossil fuels.

Goal 6 Implementation Strategies

- Develop financing mechanisms to promote/ encourage demand side reduction.
- Encourage (but do not mandate) existing buildings to meet minimum efficiency standards upon resale through public-good programs or government incentives.
- Develop and implement a pilot program to achieve demand reduction through the use of time-of-use (TOU) metering and pricing for business and residential customers, as well as adopting more attainable baseline allowances for residential consumers.
- Maximize the efficiency of existing public-good funds and assure that these funds are not diverted to other causes.
- Encourage public agencies to establish revolving funds to reinvest a portion of energy cost avoidance in further energy project development.
- Develop a concerted and comprehensive program of energy efficiency and demand reduction programs to help achieve the long-term energy planning goals of the region.
- Complete a comprehensive evaluation of current energy efficiency programs to broaden the input from key stakeholders on program design and to maximize utilization of public good program funding through continuous improvement.
- Develop and implement programs to reduce high-energy demand associated with the urban heat island, including shade trees.
- Develop and implement a regional customer education program focusing on energy efficiency and load shifting.
- Establish energy-engineering programs at local colleges and universities.
- Enhance K-12 school-based energy education programs.
- Organize a corporate pledge and commitment program to support green energy development.
- Develop a process to participate in the California Title 24 energy code updates.
- Develop training programs to ensure that local inspectors are informed about California Title 24 building code updates.
- Promote research and development that improves energy efficiency, reduces or shifts demand and creates economic development opportunities.

4. NATURAL GAS SUPPLY, INFRASTRUCTURE CAPACITY AND COSTS

Goal 7: Develop policies to insure an adequate, secure and reasonably priced supply of natural gas to the region.

Basis and Rationale

Natural gas has been the fuel of choice for most electric generation, industrial uses and home heating for the last several decades. Dwindling domestic supplies suggest that not only is increased conservation appropriate, but greater attention to overall fuel diversity is required, (in particular, renewables), as well as accessing new supplies for the interim years.

The possible construction of liquefied natural gas (LNG) terminals in Mexico could significantly increase the supply of natural gas available to the San Diego region. It should be emphasized that LNG at this point has only the potential to help to secure stable supplies of natural gas to the region. The benefit to the San Diego region would only occur if that supply has been contracted for delivery for use in the region. At this point, that has not yet occurred. In addition, the delivered cost of LNG to a re-gasification terminal, such as those being proposed in Mexico, depends on the world LNG market. LNG, like all fuels, is not without its risks, but they appear to be no greater than the risks associated with all fuels.

Although sufficient natural gas capacity exists to meet the needs of core (residential and small commercial/industrial) customers for the next 10 to 20 years, there are early indications of growing supply and capacity constraints on traditional sources of gas supply to the San Diego region. Additional interstate pipeline delivery capacity of natural gas into the Southern California region is constantly being evaluated by the industry, the CPUC, and CEC. However, San Diego must be proactive to ensure a secure and reasonably priced source of natural gas.

Natural gas demand is increasing significantly in the region. This is due in part to increased development in the inland regions that require a higher level of gas for space conditioning, but more importantly to the increased use of natural gas in new power generation projects. Significant opportunities exist to reduce the use of natural gas in the region, including the re-powering of existing power plants with more efficient combined cycle turbines, expanding the use of solar for hot water and solar pool heating, and reducing demand and peak demand by other efficiency measures.

Goal 7 Implementation Strategies

- Monitor the development of LNG supplies that are aimed at supplying the San Diego region and encourage a high priority be placed on safety and environmental performance.
- Support interstate pipeline projects that enhance the region's ability to secure its gas supply at reasonable prices.
- Participate in the policy and decision-making process at the CPUC and the CEC to evaluate and comment on capacity expansions for the SDG&E/So Cal Gas system

- Balance the gas demand needs and costs for all gas customers in San Diego against the regulatory, political, and environmental issues that facilitate or hinder gas infrastructure expansions.
- Monitor the progress of the new construction or expansion of interstate pipelines that serve California, and ultimately the San Diego region.
- Analyze the impact of bypass pipelines to offset So Cal Gas costs or provide alternate service to So Cal Gas.

Goal 8: Reduce regional natural gas per capita[57] consumption to 1990 levels by achieving the following targets:

	1980	1990	2000	2002	2010	***2020***	2030
Per Capita Natural Gas Consumption	1.14	1.00	1.20	1.18	1.14 5% Reduction	1.08 10% Reduction	1.02 15% Reduction
Target MM therm Reduction[58]					68.9	190.4	387.0

Basis

Per capita natural gas consumption compares historical actual consumption to population, and projected consumption to forecast population. Target reductions are estimates based on the comparison of achieving these goals to projected demand based on projected growth rates.

Since the early 1980's, per capita natural gas consumption has fluctuated dramatically. But since 1990, has shown a steady increase as society has demanded greater energy use to support its improving lifestyle and to achieve a higher level quality of life. The basis for this goal is to reduce natural gas consumption, measured on a per capita basis, to 1990 levels by 2030.

Goal 8 Implementation Strategies

- Facilitate and encourage the re-powering or replacement of the existing power plants with high efficiency combined cycle turbines by 2010 and 2015, respectively.

[57] Based on projected populations of 3,235,675 in 2010, 3,598,871 in 2020, and 3,889,604 in 2030 (Source: SANDAG).

[58] Assumes the Base Case REIS growth rate of 2.0% growth in electricity consumption prior to savings.

- Increase use of solar water heating in residential, pool and commercial uses to offset natural gas demand.
- Promote the use of high efficiency distributed generation technologies (e.g., combined heat and power).
- Promote the insulation of un-insulated homes built before the development of building energy codes.
- Complete a comprehensive evaluation of current natural gas efficiency programs including penetration of various technologies to better align public good funding with the current need.
- Continue to improve existing offering of all natural gas efficiency programs.
- Develop a technology transfer program to track and demonstrate new energy efficiency products.

5. TRANSPORTATION ENERGY SUPPLY AND DEMAND

Transportation energy demand consumes a much higher quantity of energy and has the most significant impact on the environment compared to all other energy uses combined. The advent of hybrid automobiles and trucks promises to significantly increase the fuel efficiency of transportation, which has seen little improvement in over two decades. Other technologies, like fuel cells, could hold great promise for efficient, zero emissions vehicles.

Goal 9: Complete a transportation energy study by June 2004 to evaluate the potential savings through more efficient use of transportation technology and fuels.

Goal 9 Implementation Strategies

- Assemble a working group of local experts on transportation energy.
- Seek funding from local, state and federal agencies and the private sector.
- Identify barriers towards achieving more efficient transportation energy use.
- Identify and recommend opportunities to reduce transportation energy.

5 APPENDIX

LIST OF ACRONYMS

APCD	Air Pollution Control District
BTU	British thermal unit
CA ISO	California Independent System Operator
CDWR	California Department of Water Resources
CEC	California Energy Commission
CFE	Commission Federal de Electricidad
CHP	Combined heat and power (cogeneration)
CO2	Carbon Dioxide
CPA	California Power Authority
CPUC	California Public Utilities Commission
CWA	County Water Authority
DG	Distributed generation
EG	Electric Generation
ERC	Emission Reduction Credits
FERC	Federal Energy Regulatory Commission
IRP	Integrated Resource Planning
JPA	Joint Power Authority
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt Hour
LNG	Liquefied Natural Gas
MMBtu	One million Btu
mmfcd	Millions of cubic feet per day
MOU	Memorandum of Understanding

MSEC	Mobile source emission credits
MW	Megawatt
MWh	Megawatt Hour
NERC	North American Electric Reliability Council
NOx	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
PPM	Parts per million
PV	Photovoltaic(s)
QF	Qualifying Facility
RCP	Regional Comprehensive Plan
REPAC	Regional Energy Policy Advisory Council
RES	Regional Energy Strategy
RMR	Reliability Must-Run
RPS	Renewable Portfolio Standard
SANDAG	San Diego Association of Governments
SDG&E	San Diego Gas and Electric
SDREO	San Diego Regional Energy Office
TOU	Time-of-use
UCAN	Utility Consumers' Action Network
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WECC	Western Electricity Coordinating Council

GLOSSARY OF ENERGY TERMS

AGGREGATOR – An entity responsible for planning, scheduling, accounting, billing, and settlement for energy deliveries from the aggregator's portfolio of sellers and/or buyers. Aggregators seek to bring together customers or generators so they can buy or sell power in bulk, making a profit on the transaction.

AVOIDED COST – The cost the utility would incur but for the existence of an independent generator or other energy service option. Avoided cost rates have been used as the power purchase price utilities offer independent suppliers.

BASE LOAD – The lowest level of power production needs during a season or year.

BASE LOAD UNIT – A power generating facility that is intended to run constantly at near capacity levels, as much of the time as possible.

BASELINE FORECAST – A prediction of future energy needs which does not take into account the likely effects of new conservation programs that have not yet been started.

BIOMASS – Energy resources derived from organic matter. These include wood, agricultural waste, landfill gas, digester gas and other living-cell material that can be burned to produce heat energy.

BRITISH THERMAL UNITS — Measure of energy.

BUILDING ENERGY EFFICIENCY STANDARDS – California Code of Regulations (California Code of Regulations), Title 24, Part 2, Chapter 2-53; regulating the energy efficiency of buildings constructed in California.

BUILDING ENVELOPE – The assembly of exterior partitions of a building, which enclose conditioned spaces, through which thermal energy may be transferred to or from the exterior, unconditioned spaces, or the ground. [See California Code of Regulations, Title 24, Section 2-5302]

CALIFORNIA ENERGY COMMISSION – The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The Energy Commission's five major areas of responsibilities are:

- Forecasting future statewide energy needs
- Licensing power plants sufficient to meet those needs
- Promoting energy conservation and efficiency measures
- Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels
- Planning for and directing state response to energy emergencies

- Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account and other sources.

CAPACITY – The maximum load a generating unit, generating station, or other electrical apparatus is rated to carry by the user or the manufacturer or can actually carry under existing service conditions.

CAPACITY CHARGES – Usually expressed as $1 kW-year. A kW-year is the value of electric capacity for a period of one year. These values change over time vs. a $1 kW value, which is an average or more stable use of the term.

CALIFORNIA DEPARTMENT OF WATER RESOURCES – (CDWR) Primary responsibility is water resource development and management. Also buys electricity for investor-owned utilities in wholesale market and resells power to investor owned utilities in form of long term contracts. These contracts have recently been renegotiated by CDWR. This is viewed as a temporary solution.

CALIFORNIA INDEPENDENT SYSTEM OPERATOR (CAISO) – Scheduler, balancing and settlement of wholesale power transaction for California utilities making wholesale power transactions

CALIFORNIA POWER AUTHORITY – Focus is on developing peak reserve margin and in developing renewable energy and conservation projects. Success depends on ability to issue bonds and have them purchased.

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) – A state agency created by constitutional amendment in 1911 to regulate the rates and services of more than 1,500 privately owned utilities and 20,000 transportation companies. The major duties of the CPUC are to regulate privately owned utilities, securing adequate service to the public at rates that are just and reasonable both to customers and shareholders of the utilities; including rates, electricity transmission lines and natural gas pipelines. The CPUC also provides electricity and natural gas forecasting, and analysis and planning of energy supply and resources. Its main headquarters are in San Francisco.

COGENERATOR – Co generators use the waste heat created by one process, for example during manufacturing, to produce steam, which is used, in turn, to spin a turbine and generate electricity. Co generators may also be QFs.

COGENERATION – Cogeneration means the sequential use of energy for the production of electrical and useful thermal energy. The sequence can be thermal use followed by power production or the reverse, subject to the following standards:

- At least 5% of the cogeneration project's total annual energy output shall be in the form of useful thermal energy.
- Where useful thermal energy follows power production, the useful annual power output plus one-half the useful annual thermal energy output equals not less than 42.5% of any natural gas and oil energy input.

COMBINED CYCLE PLANT – An electric generating station that uses waste heat from its gas turbines to produce steam for conventional steam turbines.

CONSERVATION – Steps taken to cause less energy to be used than would otherwise be the case. These steps may involve improved efficiency, avoidance of waste, reduced consumption, etc. They may involve installing equipment (such as a computer to ensure efficient energy use), modifying equipment (such as making a boiler more efficient), adding insulation, changing behavior patterns, etc.

COOLING LOAD – The rate at which heat must be extracted from a space in order to maintain the desired temperature within the space.

DEMAND RESPONSE PROGRAM – A demand reduction program where for economic or low reserve reasons a customer reduces their peak load for incentive compensation which may be either on an intermittent day head basis or for a longer term.

DEMAND SIDE MANAGEMENT (DSM) – Planning, implementation, and evaluation of utility-sponsored programs to influence the amount or timing of customers' energy use.

DEMAND (Utility) – The level at which electricity or natural gas is delivered to users at a given point in time. Electric demand is expressed in kilowatts.

DEMAND BILLING – The electric capacity requirement for which a large user pays. It may be based on the customer's peak demand during the contract year, on a previous maximum or on an agreed minimum. Measured in kilowatts.

DEMAND CHARGES – The sum to be paid by a large electricity consumer for its peak usage level.

DEPARTMENT OF ENERGY (DOE) – The federal department established by the Department of Energy Organization Act to consolidate the major federal energy functions into one cabinet-level department that would formulate a comprehensive, balanced national energy policy. DOE's main headquarters are in Washington, D.C.

DIRECT CURRENT (DC) – Electricity that flows continuously in the same direction.

DISTRIBUTION – The delivery of electricity to the retail customer's home or business through low voltage distribution lines.

DISTRIBUTED GENERATION – A distributed generation system involves small amounts of generation located on a utility's distribution system for the purpose of meeting local (substation level) peak loads and/or displacing the need to build additional (or upgrade) local distribution lines.

DISTRIBUTION SYSTEM (Electric utility) – The substations, transformers and lines that convey electricity from high-power transmission lines to ultimate consumers.

DISTRIBUTION UTILITY – The regulated electric utility entity that constructs and maintains the distribution wires connecting the transmission grid to the final customer. The Disco can also perform other services such as aggregating customers, purchasing power supply and transmission services for customers, billing customers and reimbursing suppliers, and offering other regulated or non-regulated energy services to retail customers. The "wires" and

"customer service" functions provided by a distribution utility could be split so that two totally separate entities are used to supply these two types of distribution services.

DISTRIBUTED RESOURCES (DR) – Includes energy efficiency, load management, renewables and distributed generation.

EFFICIENCY – The ratio of the useful energy delivered by a dynamic system (such as a machine, engine, or motor) to the energy supplied to it over the same period or cycle of operation. The ratio is usually determined under specific test conditions.

ELECTRIC GENERATOR – A device that converts a heat, chemical or mechanical energy into electricity.

ELECTRICITY – Electric current is created by a flow of charged particles (electrons).

EMISSION STANDARD – The maximum amount of a pollutant legally permitted to be discharged from a single source.

ENERGY – The capacity for doing work. Forms of energy include: thermal, mechanical, electrical and chemical. Energy may be transformed from one form into another.

ENERGY CHARGE – The amount of money owed by an electric customer for kilowatt-hours consumed.

ENERGY CONSUMPTION – The amount of energy consumed in the form in which it is acquired by the user. The term excludes electrical generation and distribution losses.

ENERGY EFFICIENCY – Using less energy/electricity to perform the same function. Programs designed to use electricity more efficiently – doing the same with less. For the purpose of this paper, energy efficiency is distinguished from DSM programs in that the latter are utility-sponsored and -financed, while the former is a broader term not limited to any particular sponsor or funding source. "Energy conservation" is a term that has also been used but it has the connotation of doing without in order to save energy rather than using less energy to do the some thing and so is not used as much today. Many people use these terms interchangeably.

ENVIRONMENTAL JUSTICE - California state law defines environmental justice as the “fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, or policies.”[59] The United States Environmental Protection Agency states, “Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, and local policies.”[60]

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[59] Senate Bill 115, Solis, 1999; California Government Code § 65040.12(c).

[60] US EPA. http://www.epa.gov/compliance/environmentaljustice (last checked on 11/26/02).

FEDERAL ENERGY REGULATORY COMMISSION (FERC) – regulates interstate sales and transportation of electric and natural gas.

FUEL CELL – A device or an electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes, thus producing electricity.

FUEL DIVERSITY – A utility or power supplier that has power stations using several different types of fuel. Avoiding over-reliance on one fuel helps avoid the risk of supply interruption and price spikes

GENERATING STATION – A power plant and ancillary equipment including fuel storage.

GEOTHERMAL ENERGY – Natural heat from within the earth, captured for production of electric power, space heating or industrial steam.

GIGAWATT (GW) – One thousand megawatts (1,000 MW) or, one million kilowatts (1,000,000 kW) or one billion watts (1,000,000,000 watts) of electricity. One gigawatt is enough to supply the electric demand of about one million average California homes.

GIGAWATT-HOUR (GWH) – One million kilowatt-hours of electric power. California's electric utilities generated a total of about 270,000 gigawatt-hours in 1988.

GREENHOUSE EFFECT – The presence of trace atmospheric gases make the earth warmer than would direct sunlight alone. These gases (carbon dioxide [CO2], methane [CH4], nitrous oxide [N2O], tropospheric ozone [O3], and water vapor [H2O]) allow visible light and ultraviolet light (shortwave radiation) to pass through the atmosphere and heat the earth's surface. This heat is re-radiated from the earth in form of infrared energy (longwave radiation). The greenhouse gases absorb part of that energy before it escapes into space. This process of trapping the long wave radiation is known as the greenhouse effect. Scientists estimate that without the greenhouse effect, the earth's surface would be roughly 54 degrees Fahrenheit colder than it is today – too cold to support life, as we know it.

GREENHOUSE EFFECT (relating to buildings) – The characteristic tendency of some transparent materials (such as glass) to transmit radiation with relatively short wavelengths (such as sunlight) and block radiation of longer wavelengths (such as heat). This tendency leads to a heat build-up within the space enclosed by such a material.

GRID – A system of interconnected power lines and generators that is managed so that the generators are dispatched as needed to meet the requirements of the customers connected to the grid at various points.

HYDROELECTRIC POWER – Electricity produced by falling water that turns a turbine generator. Also referred to as HYDRO.

INDEPENDENT POWER PRODUCER – An Independent Power Producer (IPP) generates power that is purchased by an electric utility at wholesale prices. The utility then resells this power to end-use customers. Although IPPs generate power, they are not franchised utilities;

government agencies or QFs. IPPs usually do not own transmission lines to transmit the power that they generate.

INDEPENDENT SYSTEM OPERATOR (ISO) – An ISO is the entity charged with reliable operation of the grid and provision of open transmission access to all market participants on a non-discriminatory basis. The California ISO is located at Folsom, California.

INTERCONNECTION (Electric utility) – The linkage of transmission lines between two utilities, enabling power to be moved in either direction. Interconnections allow the utilities to help contain costs while enhancing system reliability.

INTEGRATED RESOURCE PLANNING (IRP) – A public planning process and framework within which the costs and benefits of both demand- and supply-side resources are evaluated to develop the least-total-cost mix of utility resource options. In many states, IRP includes a means for considering environmental damages caused by electricity supply/transmission and identifying cost-effective energy efficiency and renewable energy alternatives. IRP has become a formal process prescribed by law in some states and under some provisions of the Clean Air Act amendments of 1992.

INTERRUPTIBLE SERVICE (Electric utility) – Electricity supplied under agreements that allow the supplier to curtail or stop service at times.

INTERVAL METERING – The process by which power consumption is measured at regular intervals in order that specific load usage for a set period of time can be determined.

INVESTER OWNED UTILITY – A company, owned by stockholders for profit, that provides utility services. A designation used to differentiate a utility owned and operated for the benefit of shareholders from municipally owned and operated utilities and rural electric cooperatives.

INDEPENDENT SYSTEM OPERATOR (ISO) – A neutral operator responsible for maintaining instantaneous balance of the grid system. The ISO performs its function by controlling the dispatch of flexible plants to ensure that loads match resources available to the system.

KILOVOLT (kV) – One-thousand volts (1,000). Distribution lines in residential areas usually are 12 kV (12,000 volts).

KILOWATT (kW) – One thousand (1,000) watts. A unit of measure of the amount of electricity needed to operate given equipment. On a hot summer afternoon a typical home, with central air conditioning and other equipment in use, might have a demand of four kW each hour.

KILOWATT-HOUR (kWh) – The most commonly-used unit of measure telling the amount of electricity consumed over time. It represents one kilowatt of electricity supplied for one hour. A typical San Diego home consumes about 500 kilowatt-hours per month.

LANDFILL GAS – Gas generated by the natural degrading and decomposition of municipal solid waste by anaerobic microorganisms in sanitary landfills. The gases produced, carbon dioxide and methane, can be collected by a series of low-level pressure wells and can be processed into a medium Btu gas that can be burned to generate steam or electricity.

LIFE-CYCLE COST – Amount of money necessary to own, operate and maintain a building over its useful life.

LIQUEFIED NATURAL GAS (LNG) – Natural gas that has been condensed to a liquid, typically by cryogenically cooling the gas to minus 327.2 degrees Fahrenheit (below zero).

LOAD (1) – The amount of electric power supplied to meet one or more end user's needs.

LOAD (2) – An end-use device or an end-use customer that consumes power. Load should not be confused with demand, which is the measure of power that a load receives or requires.

LOAD MANAGEMENT – Steps taken to reduce power demand at peak load times or to shift some of it to off-peak times. This may be with reference to peak hours, peak days or peak seasons. The main thing affecting electric peaks is air-conditioning usage, which is therefore a prime target for load management efforts. Load management may be pursued by persuading consumers to modify behavior or by using equipment that regulates some electric consumption.

LOAD SHIFTING – A load shape objective that involves moving loads from peak periods to off-peak periods. If a utility does not expect to meet its demand during peak periods but has excess capacity in the off-peak periods, this strategy might be considered

MARGINAL COST – The sum that has to be paid the next increment of product of service. The marginal cost of electricity is the price to be paid for kilowatt-hours above and beyond those supplied by presently available generating capacity.

MARGINAL COST – In the utility context, the cost to the utility of providing the next (marginal) kilowatt-hour of electricity, irrespective of sunk costs.

MARKET POWER – The ability of one or more suppliers and traders to manipulate or game the market to serve their own benefit.

MAXIMUM DEMAND – Highest demand of the load within a specified period of time.

MCF – One thousand cubic feet of natural gas, having an energy value of one million Btu. A typical home might use six MCF in a month.

MEGAWATT (MW) – One thousand kilowatts (1,000 kW) or one million (1,000,000) watts. One megawatt is enough energy to power 1,000 average California homes.

MEGAWATT HOUR (MWH) – One thousand kilowatt-hours, or an amount of electricity that would supply the monthly power needs of a typical home having an electric hot water system.

METER – A device for measuring levels and volumes of a customer¼s gas and electricity use.

MICROTURBINES – A small turbine engine used to produce power at a customer facility.

REAL TIME METER – A meter that can measure instantaneous loads at certain intervals.

METHANE (CH4) – the simplest of hydrocarbons and the principal constituent of natural gas. Pure methane has a heating value of 1,101 Btu per standard cubic foot.

MUNICIPAL ELECTRIC UTILITY – A power utility system owned and operated by a local jurisdiction.

MUNICIPAL SOLID WASTE – Locally collected garbage, which can be processed and burned to produce energy.

MUNICIPALIZATION – The process by which a municipal entity assumes responsibility for supplying utility service to its constituents. In supplying electricity, the municipality may generate and distribute the power or purchase wholesale power from other generators and distribute it.

MUNICIPAL UTILITY – A provider of utility services owned and operated by a municipal government.

NATURAL GAS – Hydrocarbon gas found in the earth, composed of methane, ethane, butane, propane and other gases.

NATURAL MONOPOLY – A situation where one firm can produce a given level of output at a lower total cost than can any combination of multiple firms. Natural monopolies occur in industries, which exhibit decreasing average long-run costs due to size (economies of scale). According to economic theory, a public monopoly governed by regulation is justified when an industry exhibits natural monopoly characteristics.

NET CAPABILITY – Maximum load carrying ability of the equipment, excluding station use.

NET GENERATION – Gross generation minus the energy consumed at the generating station for its use.

NONRESIDENTIAL BUILDING – any building which is heated or cooled in its interior, and is of an occupancy type other than Type H, I, or J, as defined in the Uniform Building Code, 1973 edition, as adopted by the International Conference of Building Officials.

NORTH BAJA PIPELINE PROJECT – A major pipeline from Arizona to North Baja California that runs parallel to the US/Mexican border – but is located in Mexico.

NOx – Oxides of nitrogen that are a chief component of air pollution that can be produced by the burning of fossil fuels. Also called nitrogen oxides. NOx is a precursor to Ozone – a public health threat.

OFF-PEAK – Periods of relatively low system demands.

ON-PEAK ENERGY – Energy supplied during periods of relatively high system demand as specified by the supplier.

OTAY MESA PLANT – A 510 MW power plant slated for on line operation by December 31, 2004. The developer and owner is Calpine. The plant will be located in Chula Vista, in South San Diego County.

OUTAGE (Electric utility) – An interruption of electric service that is temporary (minutes or hours) and affects a relatively small area (buildings or city blocks).

OZONE – A kind of oxygen that has three atoms per molecule instead of the usual two. Ozone is a poisonous gas, but the ozone layer in the upper atmosphere shields life on earth from deadly ultraviolet radiation from space. The molecule contains three oxygen atoms (O_3).

PARTIAL LOAD – An electrical demand that uses only part of the electrical power available. [See California Code of Regulations, Title 24, Section 2-5342(e) 2]

PARTICULATE MATTER (PM) – Unburned fuel particles that form smoke or soot and stick to lung tissue when inhaled. A chief component of exhaust emissions from heavy-duty diesel engines.

PASSIVE SOLAR ENERGY – Use of the sun to help meet a building's energy needs by means of architectural design (such as arrangement of windows) and materials (such as floors that store heat, or other thermal mass).

PASSIVE SOLAR SYSTEM – A solar heating or cooling system that uses no external mechanical power to move the collected solar heat.

PERFORMANCE-BASED REGULATION (PBR) – Any rate-setting mechanism that attempts to link rewards (generally profits) to desired results or targets. PBR sets rates, or components of rates, for a period of time based on external indices rather than a utility's cost-of-service. Other definitions include light-handed regulation that is less costly and less subject to debate and litigation. A form of rate regulation that provides utilities with better incentives to reduce their costs than does cost-of-service regulation.

PEAK DEMAND – See PEAK LOAD.

PEAK LOAD – The highest electrical demand within a particular period of time. Daily electric peaks on weekdays occur in late afternoon and early evening. Annual peaks occur on hot summer days.

"PEAKER" – A power generating station that is normally used to produce extra electricity during peak load times.

PEAKING CAPACITY – Generating equipment normally operated only during the hours of highest daily, weekly, or seasonal loads; this equipment is usually designed to meet the portion of load that is above base load.

PEAKING UNIT – A power generator used by a utility to produce extra electricity during peak load times.

PHOTOVOLTAIC CELL – A semiconductor that converts light directly into electricity.

PIPELINE – A line of pipe with pumping machinery and apparatus (including valves, compressor units, metering stations, regulator stations, etc.) for conveying a liquid or gas.

POWER – Electricity for use as energy.

POWER GRID – A network of power lines and associated equipment used to transmit and distribute electricity over a geographic area.

POWER PLANT (Note: Two separate words, not one word.) – A central station generating facility that produces energy.

PPM (PARTS PER MILLION) – The unit commonly used to represent the degree of pollutant concentration where the concentrations are small.

PUBLIC GOODS CHARGE (PGC) - a nonbypassable surcharge imposed on all retail sales to fund public goods research, development and demonstration, and energy efficiency activities, and possibly to support low income assistance programs

PUMPED HYDROELECTRIC STORAGE – Commercial method used for large-scale storage of power. During off-peak times, excess power is used to pump water to a reservoir. During peak times, the reservoir releases water to operate hydroelectric generators.

PURPA (The Public Utility Regulatory Policy Act of 1978) – Among other things, this federal legislation requires utilities to buy electric power from private "qualifying facilities," at an avoided cost rate. This avoided cost rate is equivalent to what it would have otherwise cost the utility to generate or purchase that power themselves. Utilities must further provide customers who choose to self-generate a reasonably priced back-up supply of electricity.

QUALIFYING FACILITY – QFs are non-utility power producers that often generate electricity using renewable and alternative resources, such as hydro, wind, solar, geothermal, or biomass (solid waste). QFs must meet certain operating, efficiency, and fuel-use standards set forth by the Federal Energy Regulatory Commission (FERC). If they meet these FERC standards, utilities must buy power from them. QFs usually have long-term contracts with utilities for the purchase of this power, which is among the utility's highest-priced resources.

RATE BASE – Value of property upon which a utility is permitted to earn a specific rate of return.

RATE CLASS – A group of customers identified as a class and subject to a rate different from the rates of other groups.

RATE STRUCTURE – The design and organization of billing charges by customer class to distribute the revenue requirement among customer classes and rating period.

RATEPAYER – This is a retail consumer of the electricity distributed by an electric utility. This includes residential, commercial and industrial users of electricity.

REAL-TIME MARKET – The competitive generation market controlled and coordinated by the ISO for arranging real-time imbalance energy.

REAL-TIME PRICING – The instantaneous pricing of electricity based on the cost of the electricity available for use at the time the electricity is demanded by the customer.

RELIABILITY – Electric system reliability has two components – adequacy and security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

RENEWABLE ENERGY – Resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro and wood. Although particular geothermal formations can be depleted, the natural heat in the earth is a virtually inexhaustible reserve of potential energy. Renewable resources also include some experimental or less-developed sources such as tidal power, sea currents and ocean thermal gradients.

RENEWABLE RESOURCES – Renewable energy resources are naturally replenishable, but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include: biomass, hydro, geothermal, solar and wind. In the future they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies.

REPOWERING – Either refurbishing or replacement of generating equipment, controls, water intakes and cooling system to improve efficiency and lower emissions. Repowering can result in a 30% efficiency or heat rate improvement.

RESERVE – The extra generating capability that an electric utility needs, above and beyond the highest demand level it is required to supply to meet its users^{o} needs.

RESERVE MARGIN – The differences between the dependable capacity of a utility's system and the anticipated peak load for a specified period.

RESTRUCTURING – The reconfiguration of the vertically integrated electric utility. Restructuring usually refers to separation of the various utility functions into individually operated and -owned entities.

RETAIL COMPETITION – A system under which more than one electric provider can sell to retail customers, and retail customers are allowed to buy from more than one provider. (See also direct access)

RETAIL MARKET – A market in which electricity and other energy services are sold directly to the end-use customer.

SOLAR COLLECTOR – A component of an active or passive solar system that absorbs solar radiation to heat a transfer medium which, in turn, supplies heat energy to the space or water heating system.

SOLAR CELL – A photovoltaic cell that can convert light directly into electricity. A typical solar cell uses semiconductors made from silicon.

SOLAR COLLECTOR – A surface or device that absorbs solar heat and transfers it to a fluid. The heated fluid then is used to move the heat energy to where it will be useful, such as in water or space heating equipment.

SOLAR ENERGY – Heat and light radiated from the sun.

SOLAR HEAT GAIN – Heat added to a space due to transmitted and absorbed solar energy.

SOLAR HEATING AND HOT WATER SYSTEMS – Solar heating or hot water systems provide two basic functions: (a) capturing the sun's radiant energy, converting it into heat energy, and storing this heat in insulated storage tank(s); and (b) delivering the stored energy as needed to either the domestic hot water or heating system. These components are called the collection and delivery subsystems.

SOLAR IRRADIATION – The amount of radiation, both direct and diffuse, that can be received at any given location.

SOLAR POWER – Electricity generated from solar radiation.

SOLAR RADIATION – Electromagnetic radiation emitted by the sun.

SOLAR THERMAL – The process of concentrating sunlight on a relatively small area to create the high temperatures needs to vaporize water or other fluids to drive a turbine for generation of electric power.

SO_x – Oxides of sulfur that are component of air pollution that can be produced by the burning of fossil fuels. Also called sulfur dioxide. SOx is known to cause smog and acid rain and is more predominant in burning of fuels in vehicles and power plants that burn coal and oil.

STEAM ELECTRIC PLANT – A power station in which steam is used to turn the turbines that generate electricity. The heat used to make the steam may come from burning fossil fuel, using a controlled nuclear reaction, concentrating the sun's energy, tapping the earth's natural heat or capturing industrial waste heat.

STRANDED COSTS/STRANDED ASSETS – See embedded Costs Exceeding Market Prices.

SUBSTATION – A facility that steps up or steps down the voltage in utility power lines. Voltage is stepped up where power is sent through long-distance transmission lines. It is stepped down where the power is to enter local distribution lines.

TARIFF – A document, approved by the responsible regulatory agency, listing the terms and conditions, including a schedule of prices, under which utility services will be provided.

THERM – One hundred thousand (100,000) British thermal units (1 therm = 100,000 Btu).

THERMAL POWER PLANT – any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 megawatts or more, and any facilities appurtenant thereto. Exploratory, development, and production wells, resource transmission lines, and other related facilities used in connection with a geothermal exploratory project or a geothermal field development project is not appurtenant facilities for the purposes of this division. Thermal power plant does not include any wind, hydroelectric, or solar photovoltaic electrical generating facility.

TIME-OF-USE METER – A measuring device that records the times during which a customer uses various amounts of electricity. This type of meter is used for customers who pay time-of-use rates.

TIME-OF-USE RATES – Electricity prices that vary depending on the time periods in which the energy is consumed. In a time-of- use rate structure, higher prices are charged during utility peak-load times. Such rates can provide an incentive for consumers to curb power use during peak times.

TITLE 24 – The State of California's Building Code that ensures compliance with energy standards, developed and administered by the California Energy Commission.

TRANSMISSION – Transporting bulk power over long distances.

TRANSMISSION CONSTRAINT – Transmission line capacity limitations that prevent power from being delivered to markets where needed. Usually results in curtailments and higher prices.

TURBINE GENERATOR – A device that uses steam, heated gases, water flow or wind to cause spinning motion that activates electromagnetic forces and generates electricity.

UDC (Utility distribution company) – An entity that owns a distribution system for the delivery of energy to and from the ISO-controlled grid, and that provides regulated, retail service to eligible end-use customers who are not yet eligible for direct access, or who choose not to arrange services through another retailer.

URBAN HEAT ISLAND- The term given by scientists to urban areas that have ambient air temperatures 6-10°F hotter than their surrounding areas caused by dark surfaces (asphalt, dark roofs) -that absorb more heat from the sun-and less vegetation that would provide shade and cool the air. The higher temperatures in urban heat islands increase air conditioning and raises pollution levels.

UTILITY – A regulated entity, which exhibits the characteristics of a natural monopoly. For the purposes of electric industry restructuring, "utility" refers to the regulated, vertically integrated electric company. "Transmission utility" refers to the regulated owner/operator of the transmission system only. "Distribution utility" refers to the regulated owner/operator of the distribution system, which serves retail customers.

VENTILATION – The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned or treated.

VOLT – A unit of electromotive force. It is the amount of force required to drive a steady current of one ampere through a resistance of one ohm. Electrical systems of most homes and office have 120 volts.

VOLTAGE OF A CIRCUIT (Electric utility) – The electric pressure of a circuit, measured in volts. Volts are analogous to water pressure or flow rate.

WATT – A unit of measure of electric power at a point in time, as capacity or demand.

WATT-HOUR – One watt of power expended for one hour.

WHEELING – The transmission of electricity owned by a third party to another buyer.

WHOLESALE POWER MARKET – The purchase and sale of electricity from generators to resellers (who sell to retail customers) along with the ancillary services.

WIRES CHARGE – A broad term, which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires.

WESTERN ELECTRICITY COORDINATING SYSTEM (WECC) – A voluntary industry association created to enhance reliability among western utilities.

APPENDIX A: SAN DIEGO COUNTY HISTORICAL AND PROJECTED ELECTRICITY DEMAND DATA

Year	Electricity Peak Demand (MW) (SDG&E)	Annual Growth Rate	Electricity Peak Demand (MW) (SD County)	Electricity Peak Demand (MW) (SD County w/15% res margin)
1980	2,050		1,958	2,252
1990	2,978		2,880	3,312
2000	3,500	-2.9%	3,264	3,753
2001	3,634	3.8%	3,416	3,928
2002	3,759	3.4%	3,533	4,063
2003	4,189	11.4%	3,938	4,528
2004	4,378	4.5%	4,116	4,733
2005	4,580	4.6%	4,305	4,951
2006	4,737	3.4%	4,453	5,121
2007	4,873	2.9%	4,581	5,268
2008	5,020	3.0%	4,719	5,427
2009	5,138	2.4%	4,830	5,554
2010	5,256	2.3%	4,941	5,682
2011	5,373	2.2%	5,051	5,809
2012	5,489	2.2%	5,160	5,934
2013	5,605	2.1%	5,269	6,059
2014	5,723	2.1%	5,380	6,187
2015	5,843	2.1%	5,492	6,316
2016	5,964	2.1%	5,606	6,447
2017	6,087	2.1%	5,722	6,580
2018	6,212	2.1%	5,840	6,716
2019	6,339	2.0%	5,959	6,853
2020	6,468	2.0%	6,080	6,992
2021	6,599	2.0%	6,203	7,133
2022	6,731	2.0%	6,327	7,276
2023	6,866	2.0%	6,454	7,422
2024	7,003	2.0%	6,583	7,570
2025	7,143	2.0%	6,715	7,722
2026	7,286	2.0%	6,849	7,876
2027	7,432	2.0%	6,986	8,034
2028	7,580	2.0%	7,125	8,194
2029	7,732	2.0%	7,268	8,358
2030	7,887	2.0%	7,413	8,525

REPAC MEMBER COMMENTS

San Diego County Water Authority

April 30, 2003

Irene Stillings

Executive Director

San Diego Regional Energy Office

8520 Tech Way, Suite 110

San Diego, CA 92123

RE: Draft San Diego Regional Energy Strategy

The San Diego County Water Authority is writing to offer our general support for the Draft Regional Energy Strategy. The Authority supports diversification of the region's energy portfolio to ensure greater reliability, price stability and increased local control. The proposed increase in economical and financially practicable renewable energy generation should be encouraged, as should cost effective demand side management programs.

The Authority is moving along a parallel path in meeting the region's water needs. We are broadening the water supply portfolio by simultaneously seeking to diversify the region's imported supply sources, encourage conservation, utilize reclaimed water for appropriate uses, and develop additional local resources such as ocean desalination. In addition to supply portfolio management, the Authority is developing in-region capabilities to handle water delivery following potentially catastrophic natural disasters with its Emergency Storage Program (ESP).

Projects developed in concert with the ESP, such as the Pumped Storage Project between Lake Hodges and Olivenhain Reservoir and the Rancho Penasquitos Hydroelectric Project may respectively provide between 40 MW to 90 MW of peak power and 4.5 MW of clean

base load power for the region. The development of ocean desalination facilities will provide a reliable, hydrologically independent water supply, but will increase local energy base load demands. We commend the Regional Energy Strategy for acknowledging the future energy demands of ocean desalination facilities. The Authority is in the early stages of developing desalination facilities and would like to reiterate that the environmental impacts of any new seawater desalination facility will be thoroughly reviewed and analyzed as part of a rigorous and public environmental review and permitting process that will evaluate critical environmental issues such as intake and discharge impacts.

The co-location of a seawater desalination facility with a coastal power station offers several key benefits including land use compatibility, availability of a power supply that avoids the costly and negative environmental impacts of transmission and distribution facilities and offers the use of existing intake and discharge infrastructure. Since a desalination facility typically draws its feedwater supply from the power plant cooling discharge, no increase in intake flow is required and therefore, there is no change to impacts of the intake on the marine environment.

Similar to the development of power generation facilities, each project should be considered on a case-by-case basis. The Authority recognizes that environmental issues and impacts at one site may not be directly transferable to another site. For example, there are outstanding feasibility issues, both environmental and technical, that need to be addressed before an informed decision could be made on the development of a seawater desalination facility adjacent to the existing South Bay Power Plant. On the other hand, the Encina Power Plant, the site for the Authority's 50 million gallon per day Seawater Desalination Project at Encina has a 50 year history of environmental protection and lagoon enhancement including Calurpa eradication, dredging to keep lagoon mouth open, fishery management including sponsorship of a white sea bass hatchery and sponsorship of applied marine research. In addition, scientists from the Scripps Institute have closely studied the impacts to the marine environment from the Authority's proposed facility in Carlsbad.

The following preliminary conclusions were drawn:

The increase in local receiving water salinities will be less than one percent, well within the natural variation of the Pacific Ocean at this location.

The addition of desalination concentrate to the Encina Power Station cooling water discharge will actually result in a 50 to 86% reduction in the thermal footprint associated with the existing Encina Power Station discharge.

The desalination facility would not have a significant effect on kelp, benthic species, or fish species. In fact, the effects of the discharge on the local biota would be small compared to

the effects caused by the naturally occurring seasonal and long-term changes in ocean currents and temperatures.

Due to the planned increased use of energy to operate the ESP and ocean desalination facilities, the Authority also recognizes the importance of re-powering or replacing the existing power generation facilities in the region. At Encina, significant improvements are being made to meet increased air quality standards. The Authority believes that the significant investment in transmission facilities connecting the Encina facility to the grid combined with its location strongly encourage its eventual re-powering and continued operation.

The Authority appreciates the opportunity to comment on the developing Regional Energy Strategy. We share a commitment to ensure the availability and reliability of energy resources at affordable prices while also considering the impacts on the health and the environment.

Sincerely,

Scott Willett

REPAC ADVISORY MEMBER COMMENTS

04/17/03

REPAC/REO

John Moot and

Irene M. Stillings

Executive Director SDREO

Re: SDREIS Response

Dear Irene and John

As Energy Director of The San Diego Chapter of the Sierra Club I have concerns about our renewable energy future. This is not a formal letter from the local Chapter or a policy statement by the National Sierra Club. These are merely some items I think are necessary to address in the 2030 Study response. After we have had the opportunity to review the final document you are presenting, the Sierra Club Chapter will address REPAC's final recommendations to SANDAG under a separate cover.

Here are some of my concerns that I hope will be covered in your San Diego Regional Energy Plan presented to SANDAG

I recommend that a five-member energy board made up of specialists be charged with making the decisions of our future energy needs and that Energy Board may or may not be a JPA. The members should be selected based on their expertise in Air Quality, Transmission, Distributed Power Generation, New Technology and Power Purchasing. The "Energy Board," selected by SANDAG or a Joint Powers Authority, should be advised by ad-hoc committees that are knowledgeable about each of the five areas of expertise. It is another mouth to feed but worth it.

The issues that need to be addressed:

The power lines that feed our area are marginally adequate at peak demand. We are vulnerable to a power outage if one of the two main grid sources were to be interrupted. However our good neighbors in Mexico have developed a power line that runs parallel to our border from Mexicalli to Tijuana. While that line is primarily designed for energy generated in Mexico that line could also serve as a back up should one of our services fail. We need to explore that potential thereby reducing the need for the proposed Valley Rainbow line in the Cleveland National Forest.

Wind power is available in the desert and mountains between San Diego and Yuma Arizona. We need to encourage wind generation and provide the grid necessary to move this energy into our area if wind is sufficient for generation. The right a way and towers are in place and lines can be added.

Geothermal is available in the Salton Sea area and new generating plants are currently under development with available Watts now. We can utilize that source of clean energy for San Diego and Imperial Counties. We can use that same source of energy to clean up the water in the Salton Sea. We need to be assured the water source from this 5,000 ft. deep reservoir is renewable. Fred Cagle at The Sierra Club says, “It’s an available resource”.

Photovoltaic has tremendous potential in San Diego as we have more sun hours here than many other areas in the United States. The cost of a PV solar system, not including rebates or buy down, amortized over the life of the standard residential real estate loan is about $30 a month short of self-debt service at today’s utility rates. This program creates the potential for thousands of solar systems that will fix the monthly amount the customer pays for energy for the next 30 years. Buy downs make this very attractive at today’s installed price if distributed over the life of the residential loan. This program will need support from all quarters.

Energy efficiency and solar options are decisions that should be made at the time of purchasing a home. Every new potential homebuyer should receive the education necessary to make decisions on the appliances, HVAC, weatherproofing, windows, insulation, automated energy controls, Time Of Use Meter and solar. These “Energy Education” programs are being developed by the San Diego Chapter of The Sierra Club.

Every new homeowner should be provided the opportunity to install solar based on the number of bedrooms in the home. This “rules of thumb” will assure us that a fair portion of the energy consumed in that home will be renewable solar energy. Efficiency retrofits and

the Time of Use Meter are also amortized in the cost of the residential loan all of these features continue to add value to the home as energy prices continue to soar.

Building Departments in every community in San Diego County should be part of the solar energy solution through the permit and planning departments. Their inspectors need special training. Building Departments should have specialists that are expert in the field and will expedite plans that are installing solar and doing energy efficiency. This process will motivate builders to include solar if the permit process takes less time. Permit fees need to be standardized. We have one City that charges $1.00 for solar permits now that sounds like they are encouraging solar. Contractors also need an education that will assure the buying public will be getting the quality they pay for. The Green Building Council can provide the training.

It is essential that the purchase of a PV system provide the buyer with a method to recapture the value of the asset when the ownership changes. That methodology is being developed as we speak. Proper appraisal will assure the owner that equitable value of the solar energy and the efficiency will be given when ownership changes hands. That methodology is being developed now.

Government facilities are prime candidates for PV and thermal solar. We know that public buildings are going to be here for the period of time it will take to amortize the system. solar and energy efficiency will help stabilize the cost that the public pays for our institutional energy. The system, fully amortized, will then continue to provide free energy beyond that pay back period. The City of San Diego has started their solar installations with a $4,000,000 self-debt servicing solar bond for City buildings. The City of San Diego will be the “Flag Ship” for all the other Cities in the county to do the same. Solar thermal can provide hot water for swimming pools, showers, cooking and cleaning. These self debt-servicing solar systems should be on every public building that consumes energy. A study, by an expert, of every city or county owned facility should be review for it’s solar and efficiency potential. Again the Green Building Council can help.

Fuel Cells will play a major roll in the very near future. Cars and home generating systems will be available in 2005. Pre-selling 50,000 cars will create an economy of scale that will make fuel cell car pricing competitive. Then you can plug your car into your house or work and watch the electric meter run backwards. The source of hydrogen would of course come from a solar system that can electrolyze non-potable water.

Hydrogen Economy

I wish to clarify that the Sierra Club does not endorse a Hydrogen Economy that derives the hydrogen from fossil fuel. We know hydrogen can be created from water with electrolysis using solar and recommend that method as being acceptable.

The infusion of solar and fuel cells will dramatically change the way we approach energy from the prospective of consumption, generation and distribution Additional fossil fuel plants may not be necessary if we do the same thing Japan is doing. The United States remains woefully behind where we should be. This year, the federal government will spend just $64 million on solar energy research and development. By comparison, Japan will spend $600 million. Why is a country with just 65% of the annual sunlight and a third of the US population spending ten times as much money?

The Japanese are reaping the benefits. Two of the three largest solar manufacturers in the world are Japanese. We congratulate Japan for this achievement. Clearly, the United States and San Diego can do much better.

I submit these recommendations and suggest that every five years a fresh look at the process be reviewed, while we struggle through this deregulation period.

Sincerely yours,

Dan Perkins

Peer review: Bill Powers, Casey Turner, Cynthia Fenimore, Colin Jessop, Carrie Schneider, Candy Vanderhoff, Dan Allen, Devore Smith, Don Gehring, Ginger Lamp, Tom Bowers, Michael A Freeman, Craig Sommers, Ellyn Greenway, Guido Hamacher, Holly Duncan, Lauri Isaacson, Jaye Lynn, Jennie S. Ankney, Jim Bell, Kenneth Smokoska, Mark Godwin, Mary Niez, Sergio Salvador, Mike Landry, Mike Turk, Peter Vivian, William Rector III, Richard Caputo, Scott Carlson, Scott J Anders, Skip Fralic, Stuart Rodman, Scott Whitley, Wade Vernon

PUBLIC COMMENTS

REO Presentation

By Jim Bell (619) 758-9020

Presented 4/24/03

Thank you for giving me this time to share my new book with you. Basically, it's a plan to create a healthy and life support sustaining economy in our region.

Because this organization is primarily concerned about energy, my focus will be on the regional energy study and how it relates to the energy related findings in my book.

In my view, the Regional Energy study basically said:

We can't trust the Feds to protect us from price and supply manipulations for ideological and other related reasons.

We can't trust the State to protect us from price and supply manipulations either given the states focus on paying off its high energy price contracts.

We can't trust the suppliers of electricity and natural gas as we have recently seen.

And there is no surety that there will be enough natural gas at an affordable price available to meet our and the world's rapidly expanding demand for it, for the next 10 years, let alone for 20 or 30 years.

The above given, what does the study conclude?

That our best strategy to achieve energy security is to become even more dependent on imported natural gas by building "As many as three new 500 MW power plants," two of them between now and 2010.

It's as though the people who wrote the conclusion didn't read the body of the study that came before it, which made the points listed above quite clearly.

To its credit the study does discuss the advisability of increasing efficient energy use in our buildings and associated infrastructure and developing local renewable energy resources.

But in the final analysis the study's authors appear to be unaware of the potential for efficiency improvements and renewable energy development to eliminate our dependency on imported energy all together.

Here in San Diego County, somewhere between 300 to 600 square miles of the county is covered by buildings and parking lots. (1) Assuming the 300 square mile number, covering only 34% of it or 100 square miles, would produce enough electricity each year to make our region completely energy and water self-sufficient. (2)

Addressing water self-sufficiency first, modern large scale reverse osmosis plants can produce 50 gallons of freshwater from seawater per kWh consumed. This given, 8.3 square miles of PV panels would produce enough kWh each year to produce 600,000 acre feet of freshwater from seawater. The county currently uses 600,000 acre feet of water per year. (3)

Shifting the focusing from water to energy, if all the energy currently supplied to our county by fossil fuels and nuclear power were replaced by kWh supplied by PV panels, it would require that we cover 90 square miles of county roof tops and parking lots with PV panel. This is assuming a use level of 40 kWh per day per capita for 2.9 million people. (4) For our county to just net-meter out electrically, it would require only 35 square miles of PV coverage of roof tops and parking lots to do the job. (5)

Moving on to the economics, the study's authors also seem to be unaware of the huge economic and security benefits we would gain by becoming energy self-sufficient. In addition to making us energy supply and cost secure, becoming energy self-sufficient will return the $6 billion a year we currently pay for imported energy to our local economy. (6) According to economic multiplier theory, returning $6 billion to our county's economy would add $12 to $24 billion of new economic activity to the county's economy each year. Net metering out electrically will return around $2 billion to the county's economy each year.

Another somewhat subtle economic point is that whether we invest in energy self-sufficiency or not, we are still going to pay the money and probably more given that energy cost are more likely to rise than fall.

Focusing just on electricity to make this point more graphic, if we follow the energy studies recommendations and assuming 3% electricity cost inflation, at the end of 30 years the average county household and business will be out $37,000 and $300,000 respectively with nothing to look forward to but a continuing stream of energy bills and increasing energy supply and price uncertainty. {7)

If we invest in energy self-sufficiency however, at the end of 30 years we will no longer pay for energy because we will have the PV capacity to supply all the energy we need and then some by converting free solar energy into kWh.

It's like the difference between renting and owning. Currently we rent our power from people whose only interest in us is to get as much money out of us as they can get away with.

By investing in energy efficiency improvements and renewable energy development we transform ourselves into owners, completely in control of our energy future.

One more note on the economic front. Even at present prices investing in energy self-sufficiency is more cost-effective and security-effective than staying with the fossil fuel dependent model recommended by the study.

But at the scale that would be required to get the job done within a reasonable time frame, the cost of PV panels would drop to 50 to 25% of their current cost. Efficiency improving products like energy efficient windows. Insulation, refrigerators, etc will also fall in cost with mass production making the benefits of becoming energy self-sufficient even sweeter economically and otherwise.

On to funding, currently I favor revenue bond funding since it gets us the lowest interest rate. Then use competitive bidding to hire general contractors to coordinate the installation of efficiency measures and renewable energy capacity.

A completely private sector approach, which I've suggested to Mayor Murphy, is to put out a request for proposals to the major PV manufactures and energy service companies for a private sector funded plan to make San Diego County energy self-sufficient. I also suggested that the RFP contain the proviso that at least 90% of the components use in achieving energy self-sufficiency be manufactured in San Diego County.

Whether funded and implemented through a public/private partnership or privately with private funding, the size of the project would create numerous economy of scale benefits.

These potentials are not considered in the study.

Finally, we can build all the gas fired power plants we want, but unless we control the gas needed to power them, their construction will not increase our regional energy security. Only developing our own local renewable energy resources can guarantee that.

Given the above and the fact that solar energy is the only secure energy source we have, a more logical plan for increasing our region's energy security would be to:

Aggressively pursue all cost-effective ways to use energy more efficiently.

Research and real world experience shows that our region can easily and cost effectively improve energy services while using less than half the energy currently used.

Develop our renewable energy resources as rapidly as possible. Coupled with easily achievable efficiency improvement, our county could be completely energy self sufficient by covering only 1/6 (50 square miles) of the 300 square miles of county land currently covered by building and parking lots.

Outline various funding strategies, like revenue bonds, to get low interest up-front cash to hire the contractors and trades people to make the efficiency improvements and install solar (PV) cell and other renewable energy devices.

Footnotes

1. A land use analysis of San Diego County, provided by SANDAG, lists 96 land use categories and the number of acres each land use occupies. My analysis of this list indicates that there are at least 300 square miles covered by buildings, parking lots and other areas where shading would be desirable in the County. Dividing 35.4 by this 300 square mile parking/roof area show that35.4 square miles equals 11.8% of this 300 square mile area.

2. Marion, William and Stephen Wilcox. Solar Radiation Data Manual for Flat-plate and Concentrating Collectors. National Renewable Energy Laboratory, U.S. Department of Energy, Midwest Research Institute, Contract # DE-ACO2-83CH-10093, (April 1994): p. 42. This manual shows that each square meter of horizontal surface in San Diego County intercepts, on average, 5.0 kWh of direct solar energy each day. Converting 5.0 kWh of sunlight into electricity at an efficiency of 10% equals an average of .5 kWh of electricity per square meter per day. Multiplying .5 kWh per day by 365 days per year = 182.5 kWh per year per square meter.

All the electricity sold in 2002 in SDG&E' s service area (San Diego County and part of Orange County) for all purposes equals 17.83 billion kWh. Dividing 17.83 billion kWh sold by SDG&E in its service area by the service areas population of 3.09 million equals 5,770 kWh per year per capita or 15.8 kWh per person per day.

Assuming the same consumption level for the 2.9 million San Diego County population, 2.9 million x 15.8 kWh per day equals 45,820,000 kWh per day. Dividing 45,820,000 kWh per day by .5 kWh per day per square meter equals 91,640,000 square meters. Multiplying 91,640,000 square meters times 3.86 x 10 to the -7 (the constant to convert square meters into square miles) = 35.4 square miles. In other words, installing 35.4 square miles of solar (PV) panels would produce enough electricity for San Diego County to net meter out. (Net metering out means that the County would be pushing as many kWh into the grid each year as it uses from the grid each year.

3. Author's calculations based on numbers taken from the U.N. Environmental Programme, Division of Technology, Industry, and Economics News Letter and Technical Publications Sourcebook of Alternative Technologies for Freshwater Augmentation in Latin America and the Caribbean, Part B. Also see U.N. Publication, Technology Profiles, Heading Advantages, bullet #6 and Seawater/Brackish Water Desalination by Reverse Osomosis in the British Virgin Islands, heading Costs.

4. To replace all the energy services (40 kWh per capita per day for 2.9 million people) currently supplied to our region by imported electricity, natural gas, gasoline and diesel with solar generated electricity would require less than 90 square miles of solar (PV) cell coverage.

5. Marion, William and Stephen Wilcox. Solar Radiation Data Manual for Flat-plate and Concentrating Collectors. National Renewable Energy Laboratory, U.S. Department of Energy, Midwest Research Institute, Contract # DE-ACO2-83CH-10093, (April 1994): p. 42. This manual shows that each square meter of horizontal surface in San Diego County intercepts, on average, 5.0 kWh of direct solar energy each day. Converting 5.0 kWh of sunlight into electricity at an efficiency of 10% equals an average of .5 kWh of electricity per square meter per day. Multiplying .5 kWh per day by 365 days per year = 182.5 kWh per year per square meter.

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6. This $6 billion figure is an estimate based on data taken from the SAN DIEGO REGIONAL ENERGY PLAN, Volume 2, published in December 1994 by SANDAG. Also see NEWS, Published by the U.S. Department of Labor, Bureau of Labor Statistics, released April 18,

2002, (Consumer Spending Patterns in San Diego, 1999-2000.) Although this $6 billion figure is more or less accurate today, it could ratchet up rapidly if there is any serious restriction on the flow of energy, to our region. Our recent electricity and natural gas crisis and the even more recent spike in gasoline costs are graphic examples of how price explosive local energy situation can be.

7. Author's calculations based on the $60 per month per average household and $500 for the average business.

COMMENTS RECEIVED ON REGIONAL ENERGY STRATEGY DRAFT

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8520 Tech Way • Suite 110
San Diego, CA 92123-1450
(858) 244-1177 • Fax: (858) 244-1178

July 25, 2003

Board of Directors
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101-4231

Dear Board of Directors:

The Draft Regional Energy Strategy: Energy 2030 was accepted for distribution by the SANDAG Board of Directors on May 23, 2003.

During the public comment period four letters and four phone calls were received. Following are the comments and the response.

Date	From	Comments	Response
5/30/03	Environmental Health Coalition	The wording regarding South Bay Power Plant not strong enough to prevent negative impacts on human health and the environment. Want emphasis on dry-cooling technology. Request that SANDAG conduct public workshops in South Bay to gain response from residents.	The recommendation regarding older power plants and dry-cooling were strengthened. SANDAG/SDREO will consider a workshop in late summer, 2003.

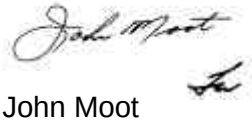
6/05/03	Mexican Consulate	Baja California, Mexico should not be singled out to "comply with California and US environmental and labor laws" (p. 3) This should apply to all neighboring areas	The wording that inadvertently focused just on Mexico was changed.
6/17/03	City of Chula Vista	Supports the emphasis on local renewables, clean distributed generation and clean efficient base load plants if this commitment to local load is made before the installation of additional peaker plants and transmission. Requests that 100% of renewable energy be located within the county and that SDG&E promote regional energy suppliers. Requests greater effort by community and SDG&E to have proposed Otay Mesa plant built. Does not support the expansion of the transmission system. Requests stronger negative reaction to SDG&E's proposal to have sole control of public good funds.	The strengthening of RES recommendations and goals will be considered by the entity that is charged with implementing the RES. Comments regarding the Implementation of the RES will be addressed in the document, presented on July 25, 2003 and to be acted upon September 26, 2003.

6/22/03	South Bay Greens	Requests that South Bay Power Plant be dismantled and replaced with an efficient, dry-cooled plant located off the Bay and that a municipal utility district or regional energy authority be approved to enhance these changes.	Changes were made to the wording of Goal 2 Implementation Strategies. Other comments will be addressed in the Implementation Plan.
6/30/03	Call from Mead Norman	Requests that the Energy Strategy include the construction of new nuclear power plants.	REPAC had decided not to address nuclear power.
6/12/03	County of San Diego	Wording and grammatical changes.	Done
6/4/03	Concerned citizen	Need more emphasis on energy transportation issues	This is being discussed.
Continuing	SANDAG staff	Wording and grammatical changes.	Done

The written comments are attached. The majority of changes to the document involved clarifying statements and strengthening wording.

Sincerely,

Executive Director, SDREO



John Moot
Chairman, REPAC

cc: Mike McLaughlin, Nan Valerio

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ehc@environmentalhealth.org ◆ www.environmentalhealth.org

May 30, 2003

Chairman Ron Morrison and SANDAG Board Members
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101

RE: Environmental Health Coalition Comments on the Regional Energy Strategy, Part 1.

Dear Chairman Morrison and SANDAG Board Members:

Environmental Health Coalition ("EHC") is submitting this letter on behalf of its members, and the communities we represent throughout the San Diego/Tijuana region. EHC has been actively involved as a non-voting advisory member of the Regional Energy Planning Advisory Council ("REPAC") since the beginning of this process.

EHC appreciates the time and financial resources that SANDAG has invested in this important process of planning our energy future. As SANDAG is considering the San Diego Regional Energy Strategy ("RES"), Part I for approval, EHC is writing to express our general support for the RES, especially its strong commitment towards pursuing renewable energy sources.

We are, however, very concerned about the impact of our energy decisions on our region's water and air quality. We believe the current language in the RES regarding the South Bay Power Plant ("SBPP") is not strong enough and needs to contain more specific language that will guarantee that the plant will not continue to pollute our air, water, and communities. In particular, we are concerned that the RES will allow existing outdated and inefficient plants, like SBPP, to continue to destroy our Bay's water quality, while also significantly impacting the public health of Chula Vista residents. It is also possible under the current language that a repower of an existing plant could be done in a manner that continues the same negative impacts on human health and the environment.

This letter raises our key concerns on the RES, Part I. We submit these concerns to SANDAG as recommended changes to the RES for your approval on July 25th, 2003.

Specific Comments on RES

1. RES should revise its language to specifically require that re-powering or replacement of any power plant be done in a manner that will significantly reduce impacts to the environment and public health.

The current language of the RES for the first bullet under *Goal 2 Implementation Strategies* states, "Repower, retire, or replace existing older, inefficient regional power plants."[1] Implicitly, the statement is referring to the South Bay and Cabrillo power plants.

EHC believes that this statement regarding existing plants should mirror the language in the bullet below it referring to new plants. Therefore, EHC requests that the language under bullet one be edited to read (changes are in bold italics): *"Repower, retire, or replace existing older, inefficient regional power plants, **if needed, with more efficient plants that are located inland, away from populated areas, and employ state-of-the-art technology that significantly reduce impacts on the environment, water resources, and public health.**"* As the bullet below it, this statement should also have a footnote to the discussion on dry cooling technology on page 18.

EHC has a long history of involvement on the issue of the SBPP and its environmental impacts. In 2001, as part of the San Diego Bay Council, EHC released a report on the environmental impacts of SBPP entitled *Deadly Power*.[2] The report made a clear case for the need to eliminate the impacts of SBPP on the San Diego Bay. Of particular concern were the following impacts of SBPP:[3]

- draws in up to 601 million gallons of bay water daily, essentially sterilizing nearly 20% of South Bay every single day;
- results in thermal and chemical discharges of 89,000 gallons of chlorine bleach, metals, and waste heat;
- kills a wide range of juvenile, larval and adult organisms in its cooling system and impacts fisheries nursery areas;
- traps and kills larger marine life through intake entrainment and impingement;
- releases estimated 400-1020 pounds of copper into the Bay each year;

[1] Regional Energy Strategy, pg. 26.
[2] Deadly Power: A Case for eliminating the impacts of the South Bay Power Plant on San Diego Bay and ensuring better environmental options for the San Diego/Tijuana Region. San Diego Bay Council, December 2001. San Diego Bay Council is a coalition of water quality environmental groups in the San Diego region. Membership includes: EHC, San Diego Baykeepers; Surfrider Foundation, San Diego Chapter; Sierra Club, San Diego Chapter; and San Diego Audubon Society.
[3] See Id.

- emits 3.1 tons of smog-forming pollutants, 1600 lbs./day of particulate matter, and 6,200 lbs./day of nitrogen oxides at peak generation;

- air pollution from the plant is linked to asthma and other adverse health effects; and

- childhood hospitalization rates for asthma in Chula Vista are significantly higher than the rest of the County.[4]

EHC continues to oppose any re-powering or replacement of SBPP that will continue to significantly impact water resources, marine life, and public health. To that end, we urge SANDAG to specifically state that the SBPP should be dismantled and moved away from the coast and from densely populated areas. Currently, the community living within a six-mile radius of the SBPP is 77% Latino and people of color, with 14.6% living below the poverty level.[5]

The RES should **require** feasible, viable, and protective alternatives to once-through cooling. In particular, a dry cooling system that uses air instead of water to cool a plant is the preferable alternative as it results in virtually no air or water polluting emissions and allows a plant to operate far away from high-density populations.

2. The RES should require all new and repowered plants in the region to utilize dry cooling technology.

The RES fails to directly support dry cooling technology or Air-Cooled Condensers (ACC) even though it states that ACCs are the solution to the water constraints in the region. **The fact that it does not recommend it over other environmentally destructive technologies such as once-through water-cooling is a significant failing of this plan.** Without the mandatory implementation of dry cooling technology region-wide, coastal plants that use once-through cooling could continue to significantly impact water quality and marine life.

It is widely recognized that dry cooling is a preferred alternative to bay cooling technology, as it does not adversely impact coastal and estuary areas.[6] Dry cooling technology makes it possible to site even the largest power plants in all climate zones and

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[4] *Clinic has kids breathing easier, Chula Vista part of asthma study*, San Diego Union -Tribune. August 22, 2002.
[5] 2000 United States Census Data (ethnicity); 1990 Census Data (poverty level). This % compares with 11.3% poverty level for the county. The 2000 census data for poverty levels were not available.
[6] *Comments on the EPA's Proposed Regulations on Cooling Water Intake StructuREP for New Facilities*, prepared by William Dougherty, Ph.D., Stephen Bernow, Ph.D, and Tom Page, Telius Institute, November 6, 2000 (the "Telius Report"), p.9; *Comparison of Alternative Cooling Technologies for California Power Plants*, prepared for the California Energy Commission by John S. Maulbetsch, Electric Power Research Institute, and Public Interest Energy Research Program, 2002.

far away from navigable U.S. waterways.[7] In addition, dry cooling systems are effective and reliable for installation at every power plant in the country[8] and cost-effective.

3. SANDAG should hold Public Involvement Workshops on the RES.

EHC requests that SANDAG make a strong commitment into holding at least one public meeting and/or workshop accessible to communities in the South Bay that are and will continue to be heavily impacted by energy generation in the region. The RES is an important document that will impact every resident of the San Diego region. As a result, residents, not just major stakeholders and elected officials, need to be involved in this process. Although we've been actively involved in the REPAC process, there has not been one public workshop that involves community members that will be the most impacted. In particular, we are very concerned about the impact of our region's energy decisions on communities that will have to disproportionately bear the environmental and public health impacts of energy generation, transmission, and distribution. In addition, we have seen no involvement of communities in the Baja, Mexico region. A public meeting in the South Bay region would allow participation from impacted communities on both sides of the border.

In addition, as SANDAG will soon be addressing the possibility of a Regional Energy entity, we strongly encourage SANDAG to initiate at least one public meeting and/or workshop to open the discussion on this topic in the community at a time when the public could attend. We recognize that the RES, by itself, is nothing without an effective implementation plan. As a result, community members should have the opportunity to voice their opinion on this crucial part of the RES.

Conclusion

EHC appreciates the opportunity to communicate our comments to SANDAG. We request that SANDAG adopt the RES with the aforementioned changes. We strongly believe that the key to a sound energy future lies in robust planning. The RES is the first step in this public process. We look forward to working with SANDAG in continuing this process and including the voice of communities that will be impacted by our decisions on our energy future.

Sincerely,

Albert Huang
Policy Advocate

[7] Tellus Report, p.17.
[8] Tellus Report, p. 16.

CONSULADO GENERAL DE MEXICO

SAN DIEGO

June 9th, 2003.

Nan Valerio
Senior Staff Consultant
SANDAG

Dear Ms. Valerio:

After reviewing the executive summary of the Regional Energy Strategy elaborated for SANDAG by the Regional Energy Policy Advisory Council (REPAC), it is our interest to make some observations to the document.

We consider the document points out some unfair treatment to Mexico. The document establishes that *"A portion of the region's electricity supply will be imported. Multiple transmission interconnects to Mexico, Arizona and the North will serve the region"*; then under the Guiding Principles section, it mentions that *"...energy generated in Mexico for use in the San Diego region should be encouraged to comply with both California and United States environmental and labor law."*

We consider that the mention of Mexico in this last paragraph is not fair enough, since it does not make any reference to other states and regions from where California will import energy according to the same executive summary. In this regard, we suggest the following text as an alternative:

"...energy generated outside the San Diego region and imported for use in the region should be encouraged to comply with both California and United States environmental and labor law."

We encourage REPAC to consider a more equilibrated and constructive vision when addressing the issue of the sustainable development of the Baja California-California region.

Sincerely,

Rodulfo Figueroa
Consul General

1549 India Street, San Diego, California 92101
Tel. (619) 308-9928 Fax (619) 231-4802

CITY OF
CHULA VISTA
OFFICE OF THE CITY MANAGER

June 17, 2003

Ms. Irene Stillings
Executive Director
San Diego Regional Energy Office
8520 Tech Way - Suite 110
San Diego, CA 92123

Re: Regional Energy Strategy and Implementation Plan Comments

Dear Ms. Stillings:

The City of Chula Vista appreciates the opportunity to provide comments regarding the Regional Energy Strategy and Implementation Plan. The City applauds the Regional Energy Office, the Regional Energy Policy Advisory Council (REPAC) and advisory members for their diligent and hard work for beginning the process to develop regional consensus on a comprehensive Regional Energy Strategy (RES) and RES Implementation Plan.

Due to deregulation's on-going impact on the region, the City is a strong supporter of regional cooperation and a unified voice to shape the San Diego region's energy future. A strong and united regional voice is important to ensure the region's economic vitality, and to ensure that residents and business are protected from unreasonably priced and unreliable energy. This emerging regional voice must also be a strong advocate of protecting our communities and the region's environmental assets from inefficient and polluting generation.

Although the Strategy has done a thorough job of identifying the infrastructure needed to meet the region's energy requirements, it does not appear that the RES has taken into account policy actions that have been adopted and implemented by other City's and agencies in San Diego County, such as the City of Chula Vista's Energy Strategy and Action Plan which was adopted in May 2001, the City of San Marco's efforts continuing efforts to aggregate energy under a municipal utility model, the City of San Diego's Energy Independence Initiatives and lastly, SDG&E's 20 Year Resource Plan. The City believes that failing to address similar and parallel efforts and the potential value these efforts bring to the Region is a crucial oversight. Individual cities, the county and SDG&E have a role to play and will continue to play a role in managing the Region's energy needs.

The City's point-by-point comments address the proposed goals and objectives of the RES and the RES Implementation Plan. The City's comments are also based on the City's own adopted Energy Strategy and Action Plan (City ESAP) and serve to ensure

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that the RES, the RES Implementation Plan and the City ESAP ultimately compliment one another to benefit the region.

Public Policy	**City Comments**
GOAL 1: Achieve and represent regional consensus on energy issues at the state and federal levels.	• The City supports a goal to gain regional consensus on energy issues. The City adopted an Energy Strategy and Action Plan (City ESAP) in May 2001 that will ensure short and mid to long-term reliability and stability of energy supplies and rates for City ratepayers. The City will support regional issues that help to further these interests.

Electricity Supply and Infrastructure Capacity	**City Comments**
GOAL 2: Achieve and maintain capacity to generate 65 percent of summer peak demand with in-county generation by 2015 and 75 percent by 2030.	• The City supports increased reliance on in-county generation to manage peak demand. Whenever possible, priority should be placed on increasing capacity from local renewable, clean distributed generation and clean efficient base load plants with commitments to local load before the installation of additional peaker plants and transmission lines.
GOAL 3A: Increase the total electricity supply from renewable resources to 15 percent by 2010 (~800 MW), 25 percent by 2020 (~1,800 MW) and 40 percent by 2030 (~3,800 MW).	• See Goal 2 and 3B comments.

Electricity Supply and Infrastructure Capacity

GOAL 3B: Of these renewable resources, achieve 50 percent of total renewable resources from resources located within the County (~400 MW by 2010, ~900 MW by 2020, and ~ 1,900 MW by 2030).

City Comments

- The City believes that the goal should be to achieve new in-county base load to increase local control and reliability and with the goal to achieve 100% of total renewable resources from in-county generation.

- A stronger commitment to building renewable energy generation in the San Diego region offers more long-term reliability for San Diego ratepayers than contracts for renewable energy from outside the region.

- Whenever possible, the RES should encourage SDG&E to contract with potential local renewable energy suppliers to the extent possible. This could include maximizing the development and purchase of methane based generation capacity from landfill and sewage treatment plant operators and promoting more renewable based distributed generation such as larger photo-voltaic (solar) energy installations and cogeneration facilities. This can also be used as a tool to attract new investments in the region or in Chula Vista.
- The RES should advocate for SDG&E to use its purchasing power to encourage the local development and installation of renewable energy generation and work more cooperatively with local governments, businesses and residents to expand incentives for renewable energy construction and supply such as PV (photo-voltaic "solar electricity") to supplement programs offered by the state.

- The region needs to have a more robust renewable supply proposal from within the region to help eliminate dependence on additional transmission lines.

Electricity Supply and Infrastructure Capacity

GOAL 4: Increase the total contribution of clean distributed generation resources (non-renewable) to 12 percent by 2010, 18 percent by 2020 and 20 percent of peak demand by 2030.

GOAL 5: Increase the transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and low-cost supply.

City Comments

- The City does not support more peaker plant facilities built in the Southbay. The RES should advocate use of existing service area capacity, continue to encourage the development of the proposed local base load plants and maximize the development of renewable and other forms of clean distributed electricity generation.

- The PUC, the California Ratepayer Advocate an independent division of the PUC, and others has made a determination that SDG&E's Valley-Rainbow Transmission line project is too expensive and not necessary. SDG&E successfully lobbied to get a re-hearing on the Valley-Rainbow transmission line project. That request was also denied by the PUC in early June.

- Although the City previously endorsed the Valley-Rainbow project, staff believes that the City's endorsement should be considered "expired" and that any future support should be subject to fresh City consideration of the quality and characteristics of any new proposal.

- The City is concerned that future transmission lines connecting the proposed Otay Mesa and coastal Baja California power generation facilities will be added to Chula Vista's eastern territory and Bayfront without consideration for undergrounding or the single pole upgrades that have reduced the negative aesthetic impacts in other areas of SDG&E's service territory.

Electricity Supply and Infrastructure Capacity cont'd.

GOAL 5: Increase the transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and low-cost supply.

City Comments cont'd.

- Priority should be placed on building new generation, including renewable generation, within the region. SDG&E should work with the appropriate agencies to provide the electricity purchase agreements that are needed to complete development of proposed projects in Otay Mesa, South Bay and Escondido before developing and possibly implementing plans to add transmission capacity that may not be needed if local generation is developed.

- The RES is unclear about how much additional transmission capacity will be needed or what the timing of those lines are relative to the development of new base load generation. The Utility Consumer Action Network (UCAN), and others have argued that the additional transmission improvements are more necessary for the SDG&E/SEMPRA plan to transmit electricity from Mexico and San Diego out of SDG&E's territory than they are to transmit electricity into San Diego for reliability and supply.

- The City would like to have new transmission lines under grounded to the maximum extent possible. Where undergrounding is not feasible the City would like to see the existing towers replaced with single poles or other more aesthetic infrastructure that is consistent throughout the SDG&E service territory.

Electricity Supply and Infrastructure Capacity cont'd.

GOAL 5: Increase the transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and low-cost supply.

City Comments cont'd.

- The City does not support reliance on importing coal-generated electricity. Using coal-fired electricity is inconsistent with the City's CO2 reduction plan. Additionally, Staff does not believe that it makes sense to ask ratepayers to pay more for renewable energy to reduce CO2 emissions and provide cleaner air while increasing contracts with coal fueled facilities.

- The City is opposed to unchecked expansion of transmission lines and expansions that the City's aesthetic and land use goals. The City does not want to see additional transmission lines and towers in the eastern territory or on the Bayfront when those upgrades can be used to help finance undergrounding improvements and spread the costs of those improvements throughout the system. (Depending on the extent of upgrades, system wide could cover several western states on the same grid system).

- The City could consider supporting the construction of new lines if the RES advocated a total resource approach. Such an approach would include: requiring the removal of old, surplus, above-ground lines when new ones are added, tying in local power sources and renewables in evaluating sites, upgrading line capacity for growth, and the consideration of growth in siting new or replacement lines. The approach should include the early and active involvement of affected local jurisdictions, specific notice and a public involvement process that avoids the surprise of new lines, poles and towers and expanded lines appearing suddenly. The RES should encourage SDG&E to adopt specific siting criteria and timelines for planning that follow the specific notice and a public involvement process.

Electricity Demand

GOAL 6: Reduce per capita electricity peak demand and per capita electricity consumption back to 1980 levels.

City Comments

- Statewide energy conservation and public education efforts do not appear to have been maintained or capitalized on successes achieved during the recent energy crises. The RES does not currently address how this trend will be reversed. Staff and the City's consultants believe that any sustained demand reduction will require program incentives that are not currently proposed.

- Tens of millions of dollars in public goods fees are currently collected from San Diego ratepayers each year as a line item on gas and electric bills. The RES does not address SDG&E's proposal to have sole control of public goods fees (PGF) to accomplish demand reduction requirements. Staff believes that SDG&E's proposal is fatally flawed. The City believes that third party access to PGFs is critical to achieving significant strides in demand reduction. The City believes that local governments should be directly involved in designing and implementing demand reduction programs. For example, the City has successfully proven our ability to achieve conservation by getting energy saving appliances, weatherization and other bricks and mortar benefits into households and businesses. Additionally, staff believes that expenditures of PGFs need to be transparent with regard to where and how funds are spent.

Natural Gas Supply, Infrastructure Capacity and Costs

GOAL 7: Develop policies to insure an adequate, secure and reasonably priced supply of natural gas to the region.

City Comments

- The City believes that the effort to secure imported natural gas should be complemented by efforts to maximize existing supplies through repowering of the existing and inefficient power plants, conservation, maximizing use of methane gas from the region's water treatment plant and harvesting natural gas from landfills.

Natural Gas Supply, Infrastructure Capacity and Costs

GOAL 8: Reduce regional natural gas per capita consumption by the following targets: 5% by 2010 (70 MM therms), 10% by 2020 (190 MM therms), 15% by 2030 (387 MM therms).

City Comments

- The City believes that emphasis should be placed on using renewable energy to conserve natural gas. Renewable forms of energy could include endorsing the increased use of solar water heaters for home and pool applications.

Transportation Energy Supply and Demand

GOAL 9: Complete a transportation energy study by June 2004 to evaluate the potential savings through more efficient use of transportation technology and fuels.

City Comments

- The City believes that an evaluation of alternative fuel vehicles such as bio-diesel, hydrogen and metal fuel cells should be included as component of the proposed study.
- The City has been active in investigating and supporting alternative vehicle demonstrations since the early 1990s and has recently completed a zinc fuel cell passenger vehicle demonstration project and the installation of a Hydrogen Electrolyzer to provide fuel for future hydrogen fuel cell bus demonstration projects.

RES Implementation Plan and City Comments

The 1978, 1984 and 1994 energy plans were not fully implemented due to the lack of an organization with the funding, staffing and authority to take the needed actions. The REIS recognized this lack of focus and direction and suggested forming a new organization. REPAC discussed and deliberated various options to form an appropriate agency to implement the RES. REPAC reached a consensus that the region must create or identify an energy entity that has a high level of accountability to the public for implementing the policies and programs outlined in the RES.

City Comments

The City believes that business-as-usual with the same players is unacceptable. As stated above, the City supports a regional energy entity to implement the RES and advocate on the region's behalf. The City endorses the recommendation presented in the RES Implementation Plan, which are:

1. Form an expert panel to evaluate the current governance structure of SDREO and REPAC and make recommendations for improvement.

2. Draft an MOU for SANDAG entities in support of the formation of a Regional Energy Agency to augment the governance, legitimacy and accountability of SDREO.

3. Work with the California Public Utility Commission and other state and federal agencies to secure funding.

SDREO has proposed an ambitious budget and staffing plan. In addition to specifics on governance, the City would like to see a specific set of goals and a budget plan before endorsing the additional costs.

The City believes that the governance of the proposed Regional Energy Agency (REA) is critical to its success. Before joining, the city would need to be comfortable that both the governance structure and the proposed allocation of benefits and risks are fair and proportionate. The location of the publicly owned South Bay Power Plant and the expiring gas and electric franchise gives the City unique opportunities outside the REA structure. For a REA to function effectively and represent the region's needs the it must provide each member agency with proportionate voting rights and should not impede an individual jurisdiction's efforts to carry out its preferred programs to provide secure affordable and more reliable sources of energy.

I hope the City's comments will assist REPAC and the SDREO finalize the RES and RES Implementation Plan and lead to a regional voice that can advocate for increased local control, increased energy independence, cleaner and more reliable energy supplies and more stable rates.

If you have any questions regarding the City's comments please feel free to call Michael Meacham at (619) 409-5870, Willie Gaters at (619) 409-5918 or myself at (619) 691-5031.

Sincerely,

Sid Morris

Sid Morris,
Assistant City Manager

cc: John Moot, REPAC Chair

June 22, 2003
1134 Arbusto Corte
Chula Vista, CA.

Mr. Ron Morrison, Chair
San Diego Assoc. of Governments
401 B street, Site 800
San Diego, CA 92101

Dear Mr. Morrison:

This letter is written because of the imminent decision SANDAG is about to make concerning our county's policy regarding energy. Although the importance of energy policy may not be in the headlines today, the importance of having a reasoned, sensible, and technologically coherent regional policy cannot be overstated.

I live in the South Bay area and am greatly concerned by the health effects of one of our greatest regional polluters—I refer to the Duke South Bay power plant. You are well aware of the tons of pollutants and the quantities of particulate matter emitted from this plant daily. Not only does it contaminate the air, but also the water which it draws in from the South Bay for its cooling needs. The discharge of heated water with chlorine bleach results in a virtual sterilization of the marine life in the slow-moving waters of the bay. The discharge of pollutants results in the children of the south bay having the highest incidence of asthma in the county.

Further, I wish to emphasize the fact that the issue of environmental justice should be one of your considerations as this plant is sited in a community which is 77% Latino and people of color with a quarter living below the poverty level.

Therefore, I am asking that you take steps to dismantle the South Bay power plant and replace it with a efficient, dry-cooled plant located off the Bay. And further that you approve the establishment of a municipal utility district or regional energy authority to enhance the financial viability of these energy efficient changes, changes which will rebound to the economic advantage of this region because of energy cost savings.

I call upon you, as Chair, and your fellow mayors, to discharge their public responsibilities to their respective community by creating entities that are for the public good.

The South Bay Greens appreciate the opportunity to comment on the Regional Energy Strategy. We look forward to working with SANDAG to effectively plan our region's energy future. In particular, we encourage you to involve the public, especially impacted communities, at every level of decision making.

Very truly yours,

Ms. Lupita Jiménez

Lupita Jimenez
Chair, South Bay Greens

Lmj

Cc: Mayor Steven Padilla
Mayor Art Madrid
Board Member Patricia McCoy