

## 2 Situation Assessment

### 2.1 Overview of the Region

#### 2.1.1 Definition of the San Diego Region and the Changing Bi-national Energy Landscape

The San Diego region includes 18 local government jurisdictions within the County of San Diego.<sup>1</sup> The San Diego region is unique compared to the rest of the state because of its proximity to Baja California, Mexico and their close integration with respect to trade flows, movement of people, and capital. Currently, there is a growing interdependency between San Diego County and Northern Baja California in terms of both the supply and demand of energy. Electric power transfers have taken place between California and Northern Baja California to some extent for more than 20 years and in the past few years, the bi-national supply and demand interdependencies have increased dramatically. Tremendous growth and unprecedented power plant development along the border in Mexico will continue to have a tremendous impact on the region's energy supply and needs, as well as a potentially significant impact on the region's environment.<sup>2</sup> Additionally, while abundant renewable resources are located within the County, the available resources are much greater when the potential of surrounding counties and Baja California are considered.<sup>3</sup> San Diego's economic and energy development future depends on bi-national as well as interregional cooperation and joint problem solving.<sup>4</sup>

San Diego County experiences many unique challenges because of its "island-like" geographic situation, bounded by the Pacific Ocean to the west, the Laguna Mountains to the east, the Mexican border to the south and Camp Pendleton to the north. Because of this fact, there are significant supply issues and risks that the region is facing unless additional supply options are made available.

#### 2.1.2 The Crisis of 2000–2001

In March 1998, the State of California implemented several fundamental changes to the structure of the electricity market to increase reliance on competitive market forces as a result of AB 1890, which was enacted as law 1996. Among other changes, the investor-owned utilities (IOU) were forced to sell their generation assets<sup>5</sup> when the power market became unbundled. IOUs no longer would generate power, they would only deliver the power that they purchased. A majority of power purchases were made in the day-ahead market, which provided no long-term hedge against price volatility.

The opening of market trading created congestion and unnecessary cost increases. While San Diego and the rest of the State fared reasonably well for the first 2 years under regulated price caps, when the caps were lifted, prices steadily climbed as regulators were unable to react to suppliers and marketers who sought to maximize profits.<sup>6</sup> Prior to 2000, while San Diego electric rates were higher than most regions of the country, they were the lowest electric rates in California, averaging about 9.7 cents per kilowatt-hour (kWh).<sup>7</sup> As a result of industry restructuring, electric rates were expected to be

<sup>1</sup> Includes the County of San Diego, and the Cities of San Diego, Chula Vista, Coronado, Imperial Beach, National City, and San Marcos, to name a few.

<sup>2</sup> 3,541 megawatts (MW) of new power plants have been recently approved in the border region and another 2,106 MW are under consideration. In addition, nearly 80 percent 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 is currently being carried out by San Diego State University. The results of this study will complement this Study and will assist policy makers to better understand the impact of energy developments in Baja California and Imperial County on the San Diego region.

<sup>3</sup> Alan R. Sweedler, ENERGY ISSUES IN THE SAN DIEGO-TIJUANA REGION, May 1999.

<sup>4</sup> One example of a significant interregional issue is the current debate over the proposed Valley-Rainbow Transmission Interconnect, to be discussed in more detail in Chapter 4.

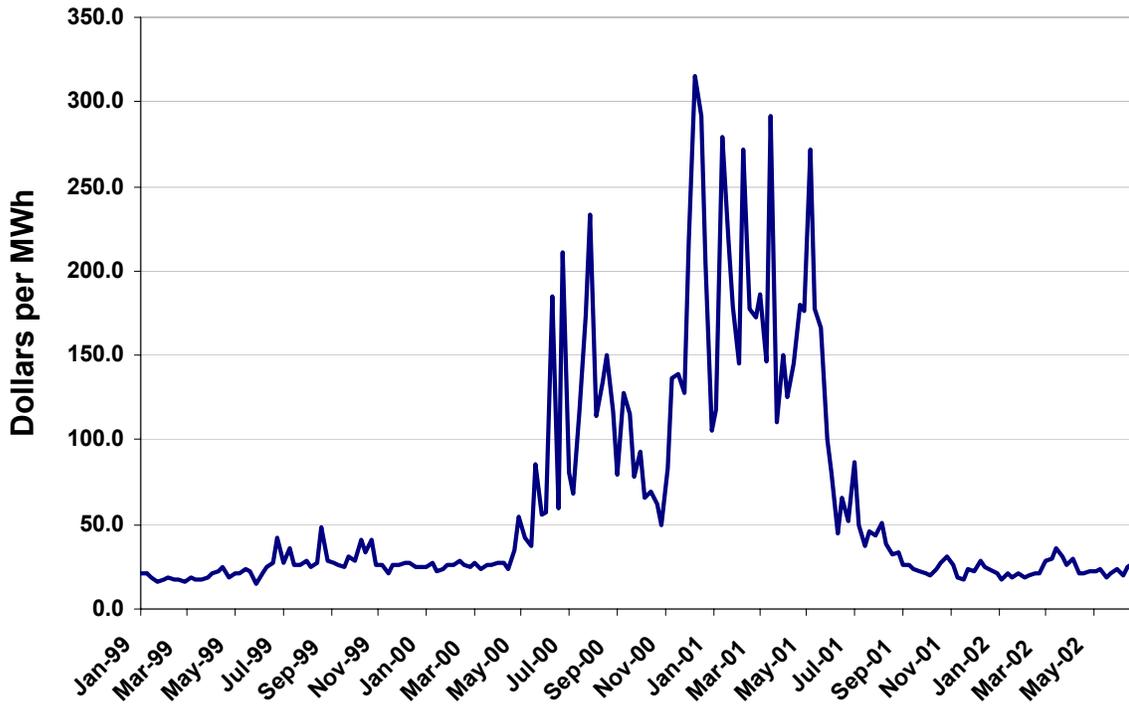
<sup>5</sup> SDG&E sold its South Bay Power Plant to the San Diego Port District, the Cabrillo Power Plant to NRG/Dynegy, and retained its 20 percent interest in the San Onofre Nuclear Generating Station (SONGS).

<sup>6</sup> A recent General Accounting Office (GAO) Report concluded that the Federal Energy Regulatory Commission (FERC), who is charged with ensuring "just and reasonable rates," lacked the insight and resources to effectively monitor the wholesale markets and that their regulatory framework was outdated for the competitive markets (Source: Public Utilities Fortnightly, July 1, 2002).

<sup>7</sup> A kilowatt-hour is the common measure for electricity consumption. A typical San Diego home consumes about 500 kWh per month.

reduced by more than 10 percent. When price caps were lifted in 1999 in San Diego, retail prices soared nearly 50 percent. The average price continued to reach new heights during the winter of 2000–2001. At one point, the energy spot prices reached an all-time high of \$1.50 per kWh while day-ahead prices exceeded \$300 per megawatt-hour (MWh), as shown in Figure 2-1.<sup>8</sup>

**Figure 2-1: Average Weekly Electricity Prices at Palo Verde**



Source: Energy News Data

Rising electricity costs significantly added to the region’s costs for electricity, jumping from \$1.7 billion in 1999 to more than \$2.5 billion in 2001. Average electricity rates are anticipated to remain high levels through at least the end of this decade as shown in Figure 2-2.

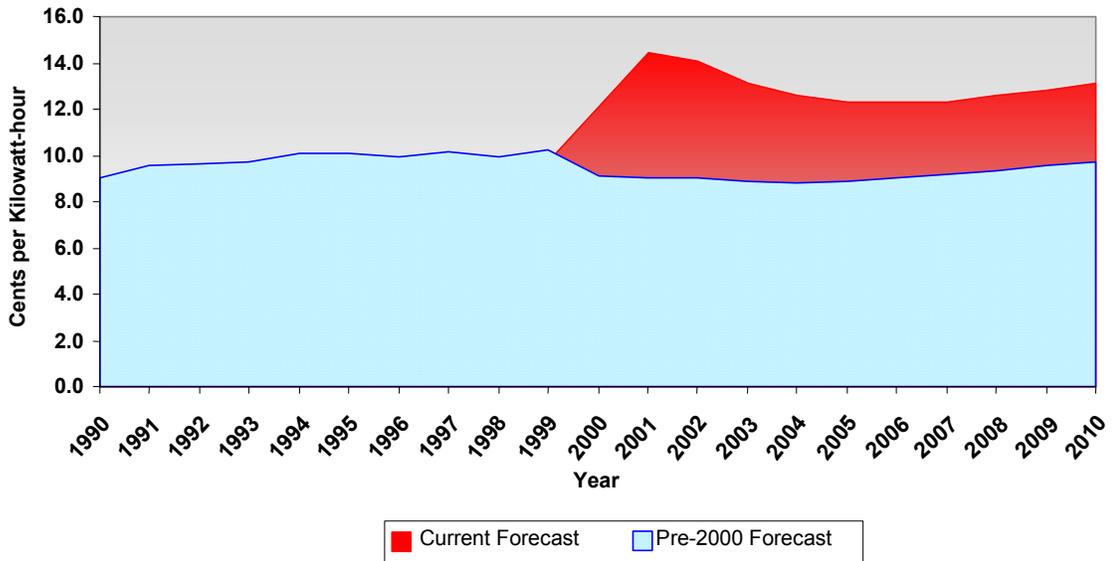
Natural gas prices also began to rise in late 2000, particularly at the Southern California Border as shown in Figure 2-3. Before 2000 natural gas prices averaged about \$2.50 per million British Thermal Units (Btus).<sup>9</sup> In January 2001, gas prices climbed to close to \$10 per million Btus with prices spiking above \$50 in Southern California. As of May 2002, natural gas prices were near their 1998 average of \$2.50.

This translated to a net additional cost of more than \$2.5 billion for electricity and natural gas in 2000–2001. 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.

<sup>8</sup> California Power Exchange: <http://www.calpx.org>

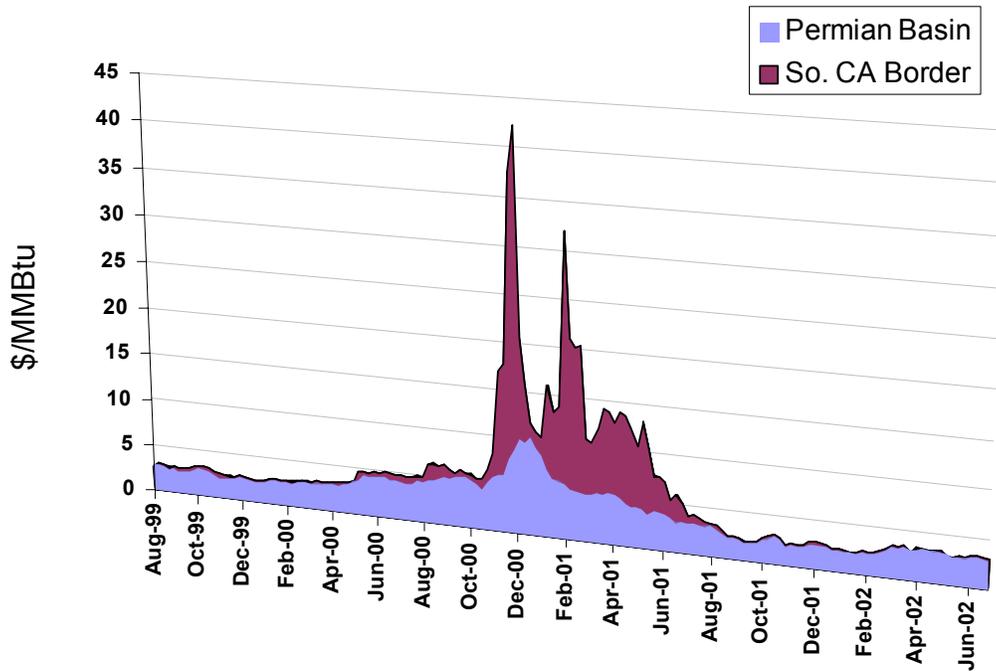
<sup>9</sup>Todd Pedersen, California Energy Commission, Natural gas Price Data Files.

**Figure 2-2: SDG&E System Average Price- Pre-2000 Forecast Compared to Current Forecast\***



Source: Current Projections – CEC 2000 – 2012  
Electricity Outlook Report, February 2002

**Figure 2-3: Natural Gas Prices at the Permian Basin and the So. CA Border**



Source: Energy News Data

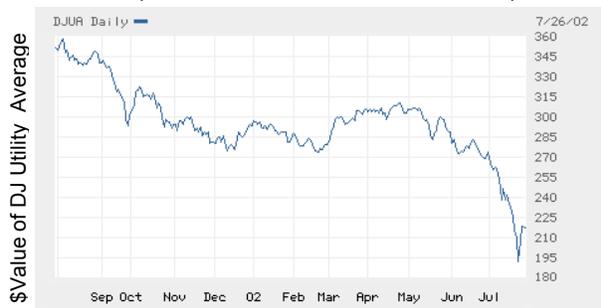
\*These costs currently exclude the recently allocated CDWR contracts.

### 2.1.3 Uncertainty of Energy Supply to Support Economic Growth

San Diego's economy and population expanded tremendously throughout the late 1990s. Likewise, so did its electricity and natural gas consumption. 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 for fear of new investments becoming "stranded," meaning that they would not be able to recover full costs in the deregulated environment. Historically supply reserve margins<sup>10</sup> were maintained at double-digit levels. During 2000–2001, reserve margins throughout California and the Western Systems Coordinating Council (WSCC) have steadily declined over time. In 2000–2001, California's margins were frequently below 5 percent (which triggers a Stage 2 electrical emergency), and occasionally below 1.5 percent (which triggers a Stage 3 emergency and creates potential for rolling blackouts).

Subsequent to the bankruptcy of Enron and the revelation of the degree to which questionable trading and accounting practices have been used in the utility industry, valuations of energy companies have fallen tremendously. At the time of Enron's bankruptcy, the aggregate exposure to Enron of all its counterparts was in excess of \$6.3 billion.<sup>11</sup> The day after Enron's filing for bankruptcy, the market capitalization of the 10 most exposed firms dropped \$4.2 billion, or an average of 10 percent. The slide in valuation of many of these companies has continued as is shown in Figure 2-4. As a result, the financial markets have tightened, restricting the ability for needed infrastructure development. Rating agencies are dictating the short and long-term strategies of many energy companies based on their level of debt/equity capital structure.<sup>12</sup> It appears that the energy industry credit crisis will continue to be a primary driver of the availability of resources for at least the next few years.

Figure 2-4: The Steady Decline of the Dow Jones Utility Average (August 2001–July 2002)  
(Source: Wall Street Journal Online)



Events of the recent past and the extreme uncertainty of the future suggest that the San Diego region and customers who depend on electricity and natural gas for their economic livelihood need to position themselves to be able to take positive steps to mitigate the effects of possible future energy market instability and volatility. It is tempting to assume that more natural gas-fired power plants and new transmission will help permanently solve the problems that exist. However, the continued patchwork and ad-hoc nature of generation, transmission and natural gas infrastructure development will likely lead to a sub-optimal balance of energy infrastructure development within the region. There is a need to take a more integrated approach to identify regional energy problems, investigate the options and trade-offs and reach regional consensus on what regional investment options should be made. A more balanced portfolio with greater local control will provide the region with a greater "hedge" against market imperfections and dysfunctions that can occur.

## 2.2 The Prognosis for 2002 and Beyond

The 2002 summer peak demand for SDG&E is expected to be 3,772 MW,<sup>13</sup> assuming a 1-in-10 hot summer and a decrease in the voluntary consumer reductions experienced in 2001.<sup>14</sup> Recent assessments indicate that there will likely be sufficient resources available in the next several years to

<sup>10</sup> 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.

<sup>11</sup> Reuters News Service, December 7, 2001.

<sup>12</sup> PUBLIC UTILITIES FORTNIGHTLY, July 15, 2002.

<sup>13</sup> While SDG&E electricity demand and consumption numbers are presented in this Study, San Diego County represents approximately 94 percent of the electrical consumption of SDG&E.

<sup>14</sup> SDG&E forecasts as of October 2001.

meet state and local electricity peak loads and required operating reserves in the event of a hot summer. While these assessments assume the construction of new natural gas-fired and renewable resources that are expected to be online at specified periods, the outlook does not fully address the transmission problems of moving the electricity to the major load centers, including San Diego. Beyond 2002, the outlook also does not fully account for recent project cancellations and delays. Therefore, local area reliability issues will continue to be problematic in the near-term<sup>15</sup>. Many financial and power analysts believe that California could face a significant power supply problem in 2004–2006 time period if the plants that were originally scheduled to be built in the state are not built soon. This is, in part, why the recent state contract renegotiation with Calpine Energy included an option for the State to intercede if Calpine's best reasonable efforts do not result in the Otay Mesa Power Plant being built and operational by the end of 2004. The proposed Otay Mesa Power Plant will be discussed in more detail in Chapter 4.

The major risks that the region will be facing in so far as electric infrastructure is concerned are:

- Supply reliability from limited indigenous generation and transmission capacity into the region.
- Congestion and potentially higher transmission prices from importing power into the region as a result of locational marginal pricing (LMP).<sup>16</sup>
- Inflated regional capacity values because of limited markets to sell "in-region" generation to the broader western market.
- Continued electric generation price volatility.

These and other issues must be addressed. The issues involve economics, finance, technology, and federal and state regulatory policy. The region must take on a greater role in framing these issues, proposing solutions, and be prepared to share in some of the investment. Key stakeholders in the region must be responsible for ensuring long-term goals are not sacrificed through short-term, reactionary fixes and incentives, which cannot be maintained and leave such policies open for criticism. Additionally, local stakeholders should be willing to share more responsibility in ensuring that the options and decisions proposed serve the broader public good—which may run counter to any one individual organization's projects, values and strategic plans.

## 2.3 The Drivers of Energy Demand and the Need for Supply: The Region's Demographics

### 2.3.1 Geography and Population

The County of San Diego, with a land area of 4,204 square miles,<sup>17</sup> is the second largest county (by population) in California and the sixth largest county in the nation (by population). The 2000 census population of the County was 2,856,300<sup>18</sup> and it is projected to grow 38 percent to 3,948,300<sup>19</sup> by 2030.

From the 1980s to the 1990s, the rate of growth of population has diminished, while during the same time period, electricity consumption has grown by 29 percent (3-year rolling average rate of 3.4% per year), and natural gas consumption has grown by 36 percent (3-year rolling average annual growth rate of 2.9%). Figure 2-5 illustrates the trends in population, housing and employment versus electricity and natural gas consumption.

Figure 2-6 shows that per capita electricity consumption has been steadily increasing from 1990–2000. Then in 2001 with the electricity crisis, there was a significant drop in per capita consumption. It may take a few years for the older growth trends to resume.

<sup>15</sup> California ISO 2002 Summer Assessment, Version 1.1, May 15, , 2002.

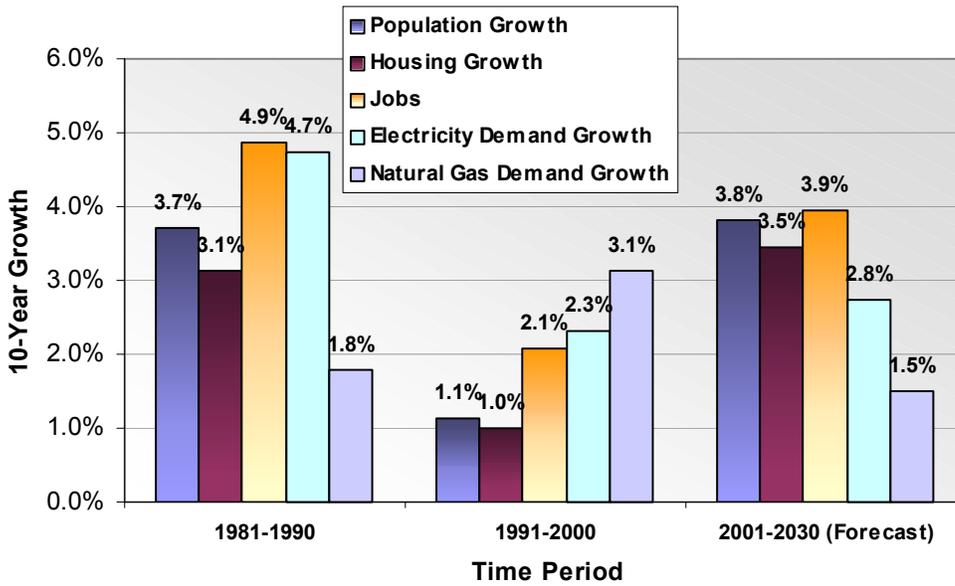
<sup>16</sup> Congestion in the transmission system on critical paths prevents surplus electricity to flow to markets that have a deficit.

<sup>17</sup> U.S. Census Bureau, 2000.

<sup>18</sup> 2030 Regionwide Forecast, SANDAG, March 2002.

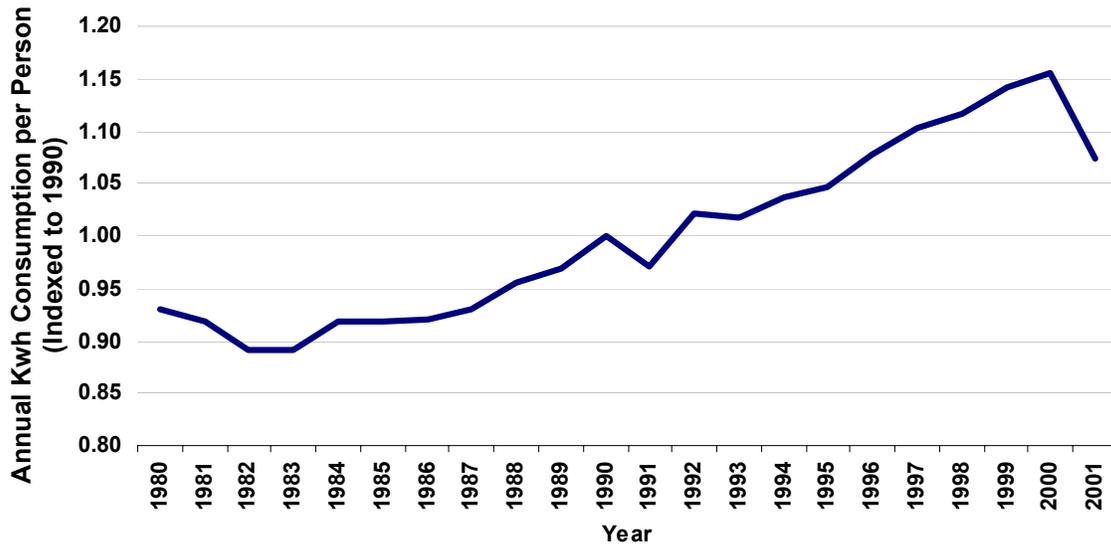
<sup>19</sup> 2030 Regionwide Forecast, SANDAG, March 2002.

**Figure 2-5: Population, Housing, Employment, Electricity, and Natural Gas Consumption Growth Rates – Historical and Forecast**



Source: SDREO

**Figure 2-6: Per Capita Electricity Consumption (Indexed to 1990)**



Source: SDREO

Tijuana is one of the fastest growing cities in Mexico, with a population more than 1 million. From 1980 to 1990, population grew by more than 60 percent and is projected to continue to grow at a similar rate until 2020, when the Tijuana population is projected to be larger than San Diego's.<sup>20</sup>

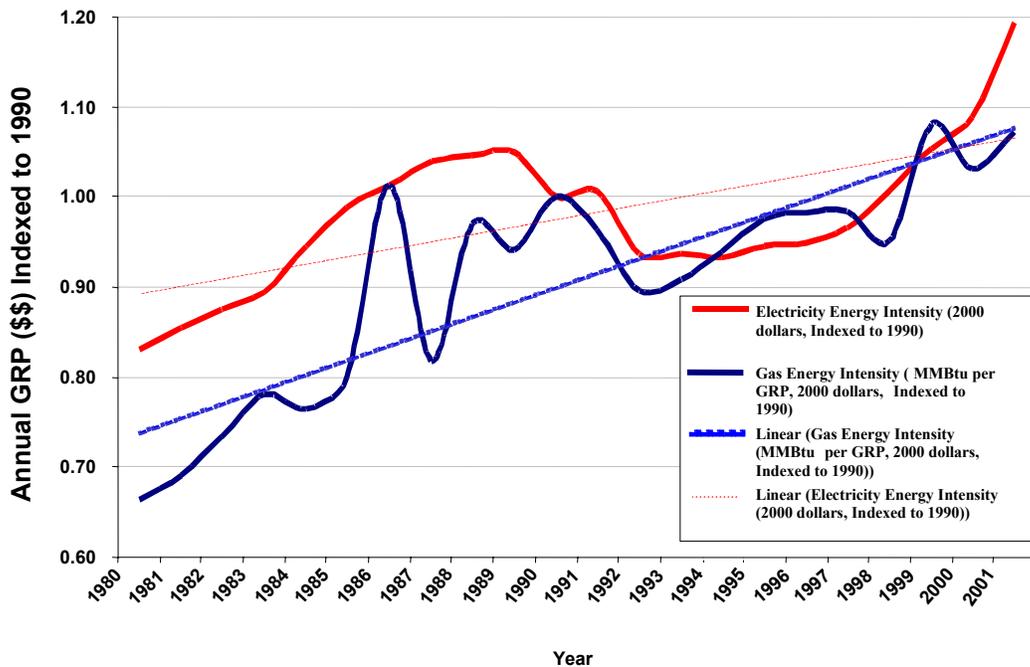
### 2.3.2 Economic Indicators: Employment, Gross Regional Product and Energy Intensity

San Diego's gross regional product (GRP) is forecast to reach more than \$125 billion in 2002, an increase of 6.5 percent<sup>21</sup> more than an estimated \$119 billion in 2001. Although the forecast for 2002 indicates a slower expansion rate, San Diego is expected to continue to experience strong economic growth.

### 2.3.3 Energy Intensity

Over the long-term, the region's economy has become more efficient with respect to electricity and gas use, as measured by its energy intensity (the amount of Gross Regional Product produced per kWh or therm consumed) as shown in Figure 2-7. While it declined, then flattened in the 1990s (attributed to the waning economy and marginal improvements in energy efficiency during these years), it has improved significantly in the last 4 years, which is largely attributed to high growth of technology, tourist and service industry sectors combined with the high-degree of commercial conservation and energy efficiency that has been accomplished as a result of the energy crisis.

Figure 2-7: Electricity and Gas Energy Intensity (2000 dollars, Indexed to 1990)



Source: SDREO

The State of California as well as the U.S. Economy has been slowly recovering from a small economic downturn that started in 2001. Several economic studies have suggested that costs of the energy crisis, declining activities in the technology sector, a 20-percent fall in export demand, and the increased rate of unemployment have all contributed to declining demands for electricity in California

<sup>20</sup> The U.S.-Mexican Border Environment: A Road Map to a Sustainable 2020, Paul Ganster Editor, Southwest Center for Environmental Research and Policy (SCERP). Monograph series, No 1. 2000.

<sup>21</sup> Inflation adjusted net increase of 1.8 percent.

in 2001. Recent economic statistics, however, indicate an increase in consumer spending, an increase in productivity, a reduction in business inventories, and an increase in business investment that will result in a recovery of demand. Many public and private studies have revised the near-term economic growth rate from less than one percent to about two and a half percent in 2002. It is most likely that the demand for electricity in California may increase in coming months because of a multiplier effect of the growing improvement in the general economic health of the State as well as the nation. This Study assumes that the significant reduction in energy demand that was experienced in 2001 due to the public's response to the energy crisis will not fully be sustained in 2002. Psychological factors associated with potential summer blackouts are not expected in 2002, because of the improvements in the generation resource supply, moderation of prices and the significant reduction in visibility of the issue in the press.

### **2.3.4 Housing**

Employment growth has been growing faster than population and housing, forcing people to live further inland and farther away from their jobs in San Diego County. In addition, most of the development is occurring further inland in hotter climate zones. The impacts on energy have been seen through these trends in the last 10 years. More (and larger) homes are being built inland in areas that require air-conditioning. Efforts to increase density and to promote re-development of urban areas should mitigate this trend somewhat. This reinforces the importance of fully integrating the Regional Energy Strategy with the region's Regional Comprehensive Plan.<sup>22</sup>

### **2.3.5 Land Use, Economic Development and Energy Infrastructure Development**

San Diego County has a very high quality of life and is an attractive location for technology-based industries. The development that has occurred to date has used virtually all of the available development areas along the coast. There will be a need to identify and hold valuable parcels of land for energy project development, including transmission right of way, co-location for more distributed resource development, and plant or facility siting that are close to transmission networks. For example, had the region worked cooperatively with Riverside County to "set-aside" a transmission corridor in the early 1990's, the subsequent development in that area may have taken into account a future significant infrastructure project mitigating the current challenges of siting the Valley-Rainbow Transmission Line (the proposed Valley-Rainbow Transmission Line is to be discussed in more detail in Chapter 4). For this reason, longer-term planning of energy infrastructure in the context of land-use planning is critical.

A key issue for this decade will be how the region helps influence a growth strategy that includes economic growth and sound planning for future energy infrastructure development.

## **2.4 Environmental Issues**

### **2.4.1 Air Quality and Non-Attainment**

San Diego County is in a 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 stationary sources that will emit more than 50 tons per year of NOx and VOC to offset these emissions. The availability of NOx emission reduction credits (ERCs) is limited in San Diego, which is a significant barrier to the building of new power plants. Banked ERCs can be purchased or an interpollutant trade of VOC ERCs is allowed by Rule 20.3(d)(5)(vi).<sup>23</sup>

An offset market could be developed whereby future power plant developers would invest in other demand reduction opportunities in the county to create emission credits in order to use more combustible fuels, or power developers could co-invest in in-region efficiency and renewable efforts to create the offsets for power stations. For example, the Otay Mesa Power Plant that has been permitted for construction, created new ERCs by funding the conversion of diesel-powered trucks and

<sup>22</sup> See <http://www.sandag.org/index.asp?projectid=1&fuseaction=projects.detail>.

<sup>23</sup> Sempra Energy has acquired emission credits for its proposed Palomar Generation Plant in Escondido through this mechanism.

boats with natural gas, thus creating Mobile Source Emission Credits (MSEC) through Rule 27. This strategy presents an opportunity for the region to continue to create more ERCs through continuing to repower vehicles while creating sorely needed ERCs and reducing the most significant emission source—vehicles.

In addition to emission issues, another primary concern relates to the siting of new plants, including peaking units. Power plants are not generally perceived as ideal neighbors and the transmission and distribution infrastructure required to support these plants create aesthetic and quality of life concerns with residents in the local community. Greater emphasis and incentive support associated with energy efficiency programs, consideration of wind energy, photovoltaics and load management can all help provide potential reductions in infrastructure cost, or at least defer expensive investments in new, larger fuel-burning facilities. However, while these options are generally less environmentally obtrusive than traditional power generation modes they typically have higher economic hurdles to overcome given the benefit cost analyses employed and typically exceed the short-term projections of market prices.

#### **2.4.2 Water Quality and Availability**

Power plants utilize less than one percent of the state's water consumed. Increasingly, water constraints are affecting the siting and output of power plants, particularly in arid regions such as San Diego. To a large extent, power costs drive the supply cost of water due to pumping requirements to bring the water into San Diego County. Future new water sources, like desalination, will be energy intense processes<sup>24</sup> that favor co-location to power plant development in order to be cost-effective. This, coupled with greater resistance to locating new energy facilities on the coast, increases the competition for water use. About 15,000 gallons of water per MWh is used by the new combined cycle gas plants being considered for San Diego County. This compares to more than double the rate for a central station boiler using once-through cooling. Water discharge from plants is a major concern due to both short and long-term impacts on ecosystems.<sup>25</sup> 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. These issues are being raised regarding the future disposition of the South Bay Power Plant by the Environmental Health Coalition.<sup>26</sup> The tradeoffs of air-cooling versus water cooling to reduce the water demand of electricity consumption will be discussed further in Chapter 4.

Section 316(b) of the Clean Water Act requires the Environmental Protection Agency (EPA) to ensure that the location, design, construction and capacity of cooling water intake structures for existing facilities with a design cooling water intake flow of 50 million gallons per day (MGD) or greater reflect the best technology available for minimizing adverse environmental impacts. On February 28, 2002, the EPA approved a proposed regulation that will establish location, design, construction and capacity standards for existing power plants that use the largest amounts of cooling water. The proposed regulation is designed to protect fish, shellfish and other aquatic life from being killed or injured by cooling water intake structures.<sup>27</sup>

Earlier in 2001, EPA established standards for new facilities and manufacturers that withdraw more than two million gallons per day (MGD) from waters of the United States, if they use 25 percent or more of their intake water for cooling. New facilities with smaller cooling water intakes will still be regulated on a site-by-site basis. For facilities who choose certainty and fast permitting over greater flexibility, the rule sets standards to limit intake capacity and velocity. Facilities who locate where fisheries need additional protection must use special screens, nets or similar devices. Facilities

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<sup>24</sup> The City of Carlsbad and the County Water Authority recently completed a feasibility study with Poseidon Resources Corporation for a 50-million-gallon-per day desalination plant to be co-located at the Cabrillo Power Plant in Carlsbad. The energy demand for the plant would be approximately 35 MW, 1 percent of the entire region's summer peak demand and by far the largest single facility demand in San Diego County.

<sup>25</sup> 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>

<sup>26</sup> Ibid.

<sup>27</sup> <http://www.epa.gov/ost/316b/ph2propfs.pdf>

withdrawing less than 10 MGD are not required to reduce intake capacity, but must use special screens, nets or similar devices if they do not.<sup>28</sup>

## 2.5 Stakeholder Issues

At the beginning of this project, a series of interviews were conducted with key stakeholder groups and leaders of San Diego businesses, government and civic organizations to identify key concerns and perceived alternatives for the region to meet its future energy requirements. These opinions and assessments were considered in defining key regional issues and evaluating alternative infrastructure solutions for the region.

Some of the general areas of agreement among the stakeholders include the following:

- There is a leadership vacuum in the area of regional energy planning and coordination.
- Energy infrastructure investments in the region is often evaluated in a piecemeal and fragmented manner. Currently there is a need for a regional energy plan to better manage the dynamics of supply and demand.
- While the cost of energy is an important concern, the costs of failing to manage the system properly far outweigh the benefits.
- Greater sense of control and self-sufficiency is desired for meeting future energy requirements in the region.
- The region cannot rely solely on federal and state policies and assume that they will best serve the interests of the San Diego region.
- Conservation, load management, distributed generation and renewables should be an important part of the portfolio of solutions.
- Additional indigenous generation sources should be added to meet our needs and to reduce high-risk, over-dependency on imports external to the County.
- Redevelopment efforts should be used to enhance energy diversity and security. For example, new construction and redevelopment could be retrofitted with solar technologies to provide local supply and to reduce the burden on the energy infrastructure.
- Consideration for the environment should be a high priority, however, there is a concern for the restrictions air emission regulations place on the region's ability to meet its energy needs.
- More public-involvement and transparency of options, costs, and tradeoffs are needed to evaluate major energy infrastructure projects.

There were also diverse opinions expressed about the following issues:

- Opinions are mixed on the type of market model that is best suited to the region's needs. After the price shocks, market failures, and trading manipulations of the past 2 years, there is skepticism about how much of an open and competitive market there should be—recognizing the initial attempt was not successful. There is a strong tendency to support the return to traditional cost-based regulation. The current CDWR contracts and current regulatory directions for the restructuring of the gas industry suggest a trend toward cost based regulation is emerging—at least for some aspects of the electric and natural gas supply chain.
- The appropriate role for public agencies in planning and implementing the region's energy future, including: full municipalization of systems within jurisdictions, community gas aggregation, ownership in generation assets, becoming more engaged in the implementation of public-good energy efficiency programs, and consideration of various Joint Power Agreements to promote regional alignment of strengths and assets (to be discussed more in Chapter 7).

<sup>28</sup> <http://www.epa.gov/ost/316b/316bph1fs.html>

- The tradeoffs associated with greater reliance on bi-national energy development projects. While many recognized development of supplies in Baja California as a positive means to meet demand, there is concern about dependency on energy projects in Baja California and the resulting environmental tradeoffs and compromises.

### **2.5.1 Key Stakeholders: Interests and Roles**

The agencies that funded the study represent a broad cross-section of the region's public interests. There are a number of other energy stakeholders that have considerable interests and leverage that could determine the makeup of the strategies and potential for future success. These organizations and other public, private, and government agencies and organizations are looking to this plan to provide the direction and leadership necessary to help define which path represents the best solution, given regional growth and energy market trends and local infrastructure conditions.

While the following list is not exhaustive, it highlights many of the strategic interests, roles and assets that will come into play and be described in more detail later in the study.

#### **2.5.1.1 San Diego Regional Energy Office**

SDREO performs a valuable function as the central clearinghouse for energy information for the region. Additionally, SDREO has an experienced staff with a growing role in designing and delivering energy programs in the region. The organization currently manages \$17 million per year in funding for innovative energy programs, such as distributed generation, renewables, energy efficiency and demand response. SDREO will have an important role to play in delivering energy management services along with SDG&E, the City and County of San Diego and other agencies. SDREO's charter is to serve the public-good in energy planning, program development and implementation. SDREO is empowered by SANDAG to develop and implement the Regional Energy Strategy.

For more information about SDREO, see <http://www.sdenergy.org/>.

#### **2.5.1.2 Regional Energy Policy Advisory Council (REPAC)**

REPAC is composed of voting members, and a number of advisory members. The voting members are appointed by their respective Boards or Councils representing the following organizations: County of San Diego, City of San Diego, SANDAG (North County Sub-region, North County Inland Sub-region, South County Sub-region, East County Sub-region), San Diego County Water Authority, San Diego Port District, SDREO, Utility Consumers Action Network (UCAN), Large Business Representative and Small Business Representative (both business representatives appointed by the San Diego Regional Chamber of Commerce). Advisory members include representatives of public and private entities that represent a broad cross-section of consumer and business interests, including, but not limited to: 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 local electric/gas utility.

Additional information about REPAC can be found at [www.sdenergy.org/planning/repac.html](http://www.sdenergy.org/planning/repac.html).

#### **2.5.1.3 County Water Authority (Water Authority)**

Comments and concerns of the County Water Authority include the following:

- Concerned about electricity prices and grid stability due to the energy intensity of its operations and the potential impact of the cost of energy on consumer water bills.
- Interested in the role of the Water Authority in solving critical infrastructure challenges.
- During the height of the energy crisis, enabling legislation was approved by the state (SB 552) that allows the Water Authority to build power generation and provide the power to its

constituency. Accordingly, the County Water Authority is now making a decision to build a 40-MW Olivenheim/Lake Hodges Pumped-Storage Project, which could be increased in size to provide 90 MW during peak periods.<sup>29</sup>

- The Water Authority is considering other distributed generation projects to offset pump-station demand, such as the 4.5-MW Rancho Peñasquitos Pressure Control and Hydroelectric Facility.<sup>30</sup>
- Potential for Federal tax savings if Water Authority builds infrastructure projects.
- Retains key competencies for planning and implementing critical utility infrastructure projects.
- Developing strategic water desalinization projects<sup>31</sup> that could enhance the value of future power plant siting.

For more information on the County Water Authority, see <http://www.sdcwa.org/>.

#### 2.5.1.4 City of San Diego

Issues and concerns of the City of San Diego include the following:

- Strong commitment from Mayor, Council and staff to lead City toward greater “energy independence.”
- Large energy user and produces more than 14 MW through:
  - Digestester gas—4.57 MWs
  - Photovoltaic Systems that will produce more than 30 kW
  - SMML Hydro—1.3 MW
  - Evaluating new natural gas fired generation at nine locations
  - Privatized 10.2 MW of land fill gas and digester gas generation systems
  - Converting a 1,200-kW standby diesel generator to a dual fueled digester gas/diesel peaking unit
  - Has 2.2 MW of radio-dispatched, standby diesel generators that are setup to help avoid rolling blackouts
- Converting diesel trash trucks to LNG/diesel dual fuel.
- Dedicated and experienced energy staff to focus on energy policy and programs.
- Proven track record in energy efficiency implementation, including the completion of major energy efficiency upgrades in 65 existing facilities since 1995 resulting in annual energy savings of more than 45 million kWh.
- Completed traffic signal retrofits to high-energy efficiency LED bulbs in more than 1,400 traffic signals citywide reducing energy consumption by more than 12 million kWh per year.
- Sustainable Building Practices policy (900-14) establishes guidelines for efficient design in City buildings and provides streamlined permitting for private builders who exceed Title 24 by specified percentages.

<sup>29</sup> More information can be found at <http://www.sdcwa.org/infra/cip.phtml#FEIR>

<sup>30</sup> Conversation with the County Water Authority.

<sup>31</sup> Currently evaluating the construction of a 50-million-gallon-per-day (MGD) facility at the Cabrillo Power Plant. The plant will have the ability to add an additional 50-MGD train in the future. If completed, the 100MGD facility could supply up to 17 percent of San Diego’s daily water supply.

- The Purchase of Energy Efficient Products policy (900-18) establishes purchasing guidelines for City procurement, including purchasing Energy Star product when available.

More information on the City of San Diego Energy Program can be found at <http://genesis.sannet.gov/infospc/templates/esd/index.jsp>

#### **2.5.1.5 County of San Diego**

The County of San Diego in 2001 exceeded its ambitious targets for energy efficiency. It developed a Master Energy Plan that included recommendations for energy conservation, low-income assistance, development of a municipal utility district, the use of distributed generation technologies and a broad-based employee awareness program which resulted in the County reducing electricity consumption by more than 22 percent from July through September 2001. There is strong commitment from Board of Supervisors and staff to lead the County towards more public involvement in planning and control of energy infrastructure. Other noteworthy actions undertaken by the County include:

- Implemented demand-side management strategies including energy efficiency efforts that resulted in as much as a 50-percent energy use reduction over last year.
- Adopted “Green Building Policy” which provides a 7.5-percent permitting fee reduction and expedited plan checking/permitting for building projects that are built more energy efficiency than California’s strict building energy codes (Title 24) allows.
- The first regional jurisdiction to eliminate permitting fees for solar photovoltaic installations.

The County Board of Supervisors also serves as the San Diego Air Pollution Control District (APCD). The APCD Regional Air Quality Strategy, completed in August 2001, ensures air quality compliance through 2020. The plan does not specifically address energy infrastructure but does emphasize future reliance on new, clean technologies, especially for peaker units. The state has provided funds to help address and create an emissions credit bank, which is now depleted and needs to be replenished.

Looking toward 2020, the APCD does not endorse any specific energy mix but rather is a regulatory agency responsible for ensuring that energy sources comply with federal, state, and local standards for emissions of air pollutants using such tools as offset requirements, analyses, and permitting. State law and regulations require emission levels of smaller-scale, distributed generation systems units to meet the same criteria as central power plants by 2007. This is being enforced by the California Air Resources Board. The region also has a bi-national air quality alliance with Baja California that is supported by EPA, with a goal of increasing communication and planning in the broader regional context.<sup>32</sup>

More information on the County of San Diego or the Air Pollution Control District can be found at <http://www.co.san-diego.ca.us/>

#### **2.5.1.6 Port of San Diego**

The San Diego Unified Port District (Port) is a public benefit corporation established in 1962 by an act of the California State legislature and ratified by the voters of the five member cities of the Port. The enabling legislation and subsequent amendments conveyed certain tide and submerged lands within San Diego Bay and the oceanfront within the City of Imperial Beach to a unified Port administration to further the development of commerce, navigation, fisheries and recreation on behalf of the State of California, which owns the lands. The lands are conveyed to the Port as a trustee of the state.

The five member cities are Chula Vista, Coronado, Imperial Beach, National City and San Diego. The Port’s jurisdiction covers waterfront property within these cities and includes 2,795 acres of land and 3,034 acres of water.

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<sup>32</sup> See <http://www.sdapcd.co.san-diego.ca.us/news/welcome.htm>.

In 1999 the Port acquired the 690MW South Bay Power Plant (SBPP) from SDG&E and contracted with Duke Energy to manage and operate the 116-acre facility. In addition, the Port acquired from SDG&E a 33-acre site adjacent to the SBPP, site of the former LNG facility.

More information on the Port of San Diego can be found at <http://www.portofsandiego.org/>

#### **2.5.1.7 San Diego Association of Governments (SANDAG)**

SANDAG serves as the forum for decision-making on regional issues such as growth, transportation, land use, the economy, the environment, and criminal justice. 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.

SANDAG's Regional Comprehensive Plan (RCP) is the region's growth management strategy that calls for an increase in the innovative mixed-use development already underway in the region's urban areas. Smart growth is the foundation for the RCP that is currently being prepared and is expected to be complete by the fall of 2003.

The Regional Comprehensive Plan will strengthen the integration of local and regional plans for land use, transportation systems, infrastructure needs, and public investments in a smart growth framework and in an interregional and international context. The regional plan will include elements such as transportation, housing, economic prosperity, open space, water supply and quality, air quality, energy, border issues, and urban design.

More information on the SANDAG can be found at <http://www.sandag.org/>.

#### **2.5.1.8 Utility Consumers Action Network (UCAN)**

Primary consumer advocate group in San Diego whose role is to represent the interests of residential and small business utility customers in the region. The organization is a major "watch dog" for consumer protection and prudent regulatory and utility policy for consumers. UCAN is very well networked in the state and it has a good grasp of energy policy and regulatory issues. It also has very good insights on the energy supply and demand issues in the County. Key issues raised by UCAN in the interviews were the following:

- The San Diego region is seriously disadvantaged by the absence of a regional energy plan or an entity accountable for implementing such a plan. There is a need to consider a strong role of energy efficiency, distributed generation and renewables and there is a large potential for these options over the Study period.
- Disjointed and questionable decisions are being made by the State and local utilities about long-term infrastructure investments that may disadvantage the San Diego region for decades to come.
- Additional bi-national solutions should be considered beyond the traditional supply-side and some growth cooperation.
- The economic development and employment impacts of emerging energy technologies in generation, energy efficiency and demand-side usage could contribute to San Diego's future economic prospects.

More information on UCAN can be found at <http://www.ucan.org/>

#### **2.5.1.9 Other Regional Stakeholders of Note**

##### ***Sempra Energy***

- Owns both San Diego Gas and Electric Company and Southern California Gas Company, which is the largest natural gas distribution company in the United States.

- Large enterprise-wide energy holding company, which including trading operations, power energy services and plant development.
- Strong commitment to developing supply resources in the region, with proposed power plants in San Diego (Escondido) and Baja California.
- Co-developed Baja Norte pipeline in northwestern Mexico.
- Potential developer of LNG facility in Baja California.

The two most visible Sempra affiliates that will affect San Diego County's energy future are Sempra Energy Resources and Sempra Energy International. These two unregulated companies are rapidly establishing their presence in the region with several high-profile projects. The Baja Norte pipeline is the near-term project that is highly visible. Sempra Energy International has a 30-percent stake in that pipeline. One of the LNG plants being proposed in Mexico also has Sempra Energy International as a principal.

Sempra Energy Resources is a major contractor with the State of California for electric energy over the next decade. Sempra Energy Resources also has planned a 500-MW facility in Escondido, in northern San Diego County. Sempra Energy Resources has also announced a major interstate pipeline project for the Southwest.

#### ***San Diego Gas & Electric***

- Owner and operator of electricity transmission, distribution and natural gas distribution infrastructure.
- Administers strategic energy efficiency programs and in the region.

#### ***City of Chula Vista***

- One of the most proactive cities in the region in terms of energy programs.
- Adopted Carbon Dioxide (CO<sub>2</sub>) Reduction Plan in November 2000 with goal of reducing CO<sub>2</sub> emissions in City operations by reducing fossil-energy consumption.
- Adopted a City Energy Plan to address long-term energy issues and protect Chula Vista constituents from unreliable energy supply and volatile prices. The Plan includes aggressive programs that address demand side management, energy efficient and renewable energy outreach programs for businesses and residents, energy acquisition, power generation and distributed energy resources and legislative actions.

#### ***City of San Marcos***

Have formed a municipal utility to provide electric distribution and aggregate gas supply to businesses and citizens.

The City's current Charter, approved by voters in 1994, allows the formation of a municipal utility. A municipal utility was formed in August 2000 and named the Discovery Valley Utility (DVU). The City has a power supply option from the Magnolia Power Plant, which is currently under development, to secure a low-cost supply of power in the future.<sup>33</sup>

#### ***U.S. Navy Region Southwest***

As the largest energy consumer in the region, has implemented a comprehensive and aggressive energy management program that saved 14.7 MW, 57 million kWh and 1.7 million therms in fiscal year 2000–2001.

#### ***Duke Energy***

Duke operates the South Bay Powerplant under contract to the Port of San Diego. Under this contract, Duke must find a suitable location for a replacement plant by 2006 and have a new plant

<sup>33</sup> City of San Marcos, Electric and Gas Utility Options Study, conducted by EES Consulting, February 2002

operational by December 31, 2009. Duke owns the air emission offset credits associated with the SDG&E sale of the SBPP, air credits arising from any improvements or modifications, and air credits resulting from the SBPP closure. If Duke proposes to sell or convey to any third party any portion of the air credits, Duke has agreed to offer the Port the right-of-first refusal (except in connection with the transfer of rights and interest with respect to a replacement generation plant, with the Port's consent).

***NRG/Dynegy***

NRG/Dynegy own and operate the Cabrillo Powerplant located in Carlsbad and several peaking units throughout the County.

**2.6 Challenges, Threats and Opportunities**

Based on the above review of current external trends, policies, the prevailing energy supply landscape, and taking into account the insights gained from the key stakeholder interviews, the following section discusses the strengths, weaknesses, opportunities and threats for the San Diego region as outlined in the following table and addressed in this study (See Table 2-1).

**Table 2-1: Strengths, Weaknesses, Opportunities, and Threats for the San Diego Region**

Issue	Challenge/Threat	Opportunity
<p>Planning</p>	<p>No comprehensive and integrated regional energy planning mechanisms now exist. This leads to reactive positions, suboptimal infrastructure and high risk from market volatility.</p> <p>A cohesive regional vision on the alternative and most preferable energy supply and demand options and infrastructure investment implications is missing.</p> <p>Cohesive and integrated regional energy policies and programs are lacking. There is considerable collaboration, but little in the way of organized processes for identifying issues, evaluating the issues, selecting a solution and implementing electricity and natural gas supply and demand programs.</p> <p>Current energy infrastructure decisions are evaluated in an isolated, fragmented manner—and often without public and community discussion. For example, electric transmission issues need to be evaluated in light of broader Southern California generation needs. The State of California has focused on short-term solutions, many with long-term implications (e.g., CDWR long-term contracts for supply). There is a need to start addressing regional energy supply/demand balancing issues and in light of evolving market design models.</p> <p>Evaluate hedges and options to market volatility</p> <p>The region being a major military center needs to diversify supply options, seeking both central generation based and distributed based resources.</p>	<p>Local city, county and regional governing bodies are currently highly sensitized and active in formulating policy and programs for energy efficiency and alternative resources. There is a need to solidify this activity into a robust regional energy strategy that looks comprehensively at the best integrated solutions for the region.</p> <p>Formulate a regional vision on energy strategies for supply development, distributed resources, demand reduction, energy conservation, use of existing renewable resources, energy storage systems and distributed generation options.</p> <p>Create a regional energy policy body and organize an active lobbying effort to better represent regional electricity and natural gas supply and demand policies, as the state is developing its own policy and programs. This process should also include SDG&amp;E and other power development interests in the region including Mexico.</p> <p>Develop an energy strategy and plan that takes into account broad regional energy infrastructure solutions.</p> <p>The region needs to work to limit no more than one half of its electric and natural gas resource portfolio to market price volatility. This suggests a strong role for public-private partnerships in generation and transmission asset development and a strong role for conservation and renewable energy resources.</p> <p>Create a renewed energy conservation, distributed resource and load management ethic in the region to meet a substantial amount of new growth over the next 30 years from non-traditional supply sources.</p>

**Table 2-1: Strengths, Weaknesses, Opportunities, and Threats for the San Diego Region (continued)**

Issue	Challenge/Threat	Opportunity
<p>Policy</p>	<p>Lack of coherent statewide natural gas and electricity policy and continued failure of state to address fundamental capacity and pricing issues in state.</p> <p>Strong local government policy and regulation may be needed to influence regional growth and ensure that the building stock becomes very efficient.</p> <p>A growing FERC role in the West is anticipated regarding market design and infrastructure development.</p>	<p>San Diego Region needs to seek control over its own energy destiny and not assume that Sacramento, San Francisco or Washington, D.C., have the best solution.</p> <p>Great need to do policy papers and briefs on key regional infrastructure and regulatory initiatives like BCAP and GIR, and market, capacity credits and other critical regulatory initiatives.</p> <p>The region needs to more closely track FERC rulemaking and evaluate potential FERC initiatives and how beneficial they are to San Diego County.</p>
<p>Organization</p>	<p>There is a significant amount of fragmentation and diverse opinion among state agencies. The region needs to be sure that local issues and concerns are adequately addressed in these deliberations. Currently, there is no coordinated regional effort to engage the many state and federal processes. Monitoring these proceedings will require dedicated resources and close coordination of effort among local agencies and stakeholders.</p> <p>Given the growth in Northern Baja and Tijuana there is a risk for further environmental decay in the Imperial Valley and a risk to the quality of life for the entire region.</p> <p>Future power plant development is at risk in the county and state unless the state implements policies and programs to continue to stimulate new plant development, along with conservation and renewable resources.</p>	<p>The region currently has a strong set of civic and business organizations and an active local government and interagency collaboration to pave the way for a strong regional energy policy and program.</p> <p>The region needs to crystallize its view on energy supply and demand matters and work closely with state and federal policy makers to ensure that the "right" policies are being proposed that are beneficial to the San Diego region.</p> <p>Identify and evaluate additional sources of regional power supply options, perhaps through a joint power authority (JPA) or through existing organizations such as the County Water Authority.</p> <p>The region needs to gain the cooperation of Tijuana and other governmental entities in Northern Baja California regarding carefully planned energy strategy development and policies that use best available technology and also embrace a strong distributed and renewable energy future.</p> <p>The policies of the CEC, CPUC and CAISO need to be closely scrutinized to ensure that an adequate supply of local generation occurs and is properly interacted with the larger WSCC market.</p> <p>There is a need to ensure that local take away capacity is properly managed and costs controlled for natural gas. The closer natural gas infrastructure gets to local markets, the less competition and choice exists.</p>

**Table 2-1: Strengths, Weaknesses, Opportunities, and Threats for the San Diego Region (continued)**

Issue	Challenge/Threat	Opportunity
Binational and Interregional	Quality of life and environment are at risk from significant new plant development in Northern Baja, Mexico.	<p>A strong regional orientation that embraces Baja California as an integral part of planning for infrastructure development.</p> <p>Proximity to Mexico and its land resources and power development projects creates an opportunity to broaden power supply options—mutual dependency of energy infrastructure and supply investments is a benefit.</p> <p>Need to use U.S. trade and other foreign aid to encourage use of best available technology and energy efficiency and load management South of the Border.</p>
Business and Industry	Future job growth and overall community growth will be at risk if the past energy shocks continue in the future. In fact, the entire state is at risk.	<p>The region enjoys a strong presence of innovative energy technology firms within the County (e.g., Solar Turbines, SAIC, SeaWest, AstroPower, Maxwell Technologies, Metallic Power, General Atomic, Cannon Power Corporation). 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.</p> <p>A robust, diversified, service economy with some significant manufacturing in traditional and computer electronic areas exists.</p>
Economic Development	Centralized energy systems create outflow of income and cost jobs versus more distributed energy technologies, which are more labor intensive. The region already has a strong energy technology base and this should be leveraged.	Local businesses that are not as significantly impacted by rising energy cost should be promoted.
Environmental	Emission ceilings have been reached and the region requires offsets for new, significant emissions. This will make future power plant development in the region very expensive. Some plants being developed in Mexico are not using best available technology.	Creation of air pollution offsets through implementation of energy efficiency, renewables and replacing polluting vehicles with cleaner, economically viable technologies. A bid and trading market could also be created. However, emission reductions may qualify only if they comply with EPA and APCD requirements.

**Table 2-1: Strengths, Weaknesses, Opportunities, and Threats for the San Diego Region (continued)**

Issue	Challenge/Threat	Opportunity
Supply	<p>Electrical and Gas system needs expansion to manage growth.</p> <p>Lack of sufficient energy infrastructure investment in the County and limited transmission capability can create severe economic dislocation due to an outage of a major energy infrastructure facility.</p> <p>Trading and capacity risk must be controlled. This risk is now being addressed in the market model discussions of the state and FERC. The state needs to participate in this process.</p> <p>Capacity values being too high due to limited markets to sell the generation to unless additional transmission is built.</p>	<p>The region led the nation in the installation of cogeneration systems in the early 80's prior to the technologies demise by restructured electric rates. The engineering and contracting knowledge is available in San Diego for accelerated development of small-scale, distributed generation.</p> <p>SDG&amp;E has well defined interconnection requirements, and in recent years, has been cooperative towards interconnection requests.</p> <p>There needs to be more infrastructure development in terms of both generation and transmission in the region.</p> <p>Need to secure a diverse portfolio of gas and electric options, including energy efficiency, demand response and renewables/DG.</p> <p>A public process is needed to help review and evaluate regional transmission investment requirements and options.</p> <p>Region needs additional transmission—the key question is when, where, and how best to develop it considering new generation options.</p>

## 2.7 The Challenges of Market Design and Performance

The current market structure is being modified in order to ensure that adequate generation is available in a timely, efficient and sustainable manner. Although market design is largely out of the hands of San Diego, there may be an opportunity to influence the process to ensure future needs and interests are properly addressed. Further exploration is needed to determine the most effective capacity payment options, i.e., implementation of capacity surcharges tied to energy purchases, requiring loads to obtain reserve capacity, government intervention through purchase of facilities or contracts, or utility ownership of reserve capacity. California and San Diego County remain in a very serious supply and infrastructure situation. Also, FERC recently completed an audit of California-Independent System Operator (CAISO) activities and will soon decide on its independence and appropriate role in the market.

Several issues that remain include:

- It appears that California and the market are not building enough generating capacity. The boom/bust cycles in the power industry demonstrates that mixed markets and development paths are needed, and that close oversight of reserves is needed by Governments.
- The state lacks a capacity market that is sufficient and liquid—delays in forming a market for capacity may exist until late 2003-2004.
- Limited new transmission has been built in the state to alleviate congestion.

The CAISO and the Federal Energy Regulatory Commission (FERC) have been working on various proposals that would affect California's future market design. The CAISO's Market Design 2002 (MD02) is a proposal that attempts to address flaws in the current market structure. The goal is to improve reliability of the grid, establish better locational signals that encourage power plants to be built where they are needed most, to address congestion on the transmission system, and to give the ISO new market power mitigation tools.<sup>34</sup>

It is not clear that the CAISO proposal for a standard market model will be accepted by FERC. FERC has made it clear that it is going to be a more active participant in monitoring and guiding California wholesale electric and infrastructure. While no formal decisions have yet been made, FERC is not satisfied with the progress California is making on infrastructure development. Greater FERC oversight and initiatives to better integrate California into the broader Western power market will likely occur. Should supplies not develop within the county and in the State, better integration into the Western Power Market could help moderate prices. Also, as FERC has noted, a stronger capacity market needs to be developed in California. In addition, a more dynamic and price responsive load management market is needed as is being used in other regions like the Northeast's PJM pool—which is often viewed as a superior market model.

Flaws in market design and rules have been a major factor leading to excessively high prices for electricity. In addition, overzealous trading and gaming practices and the lack of regulatory scrutiny contributed to this issue. There appears to be excessive regulation affecting power plant development in the state, and there appears to be excessive reliance on traded wholesale power in the state. Until recently, FERC has not been vigilant in policing market performance. Now, with the new market design rules forthcoming, FERC wants to create a more standard model for market design vis à vis the creation of regional transmission organizations (RTOs). This will have a significant impact on the development of future markets.

Additional resources will be needed including the development of sufficient transmission and reserve capacity to move the power from the producing markets to consumers. In addition, more reserves are needed. Presently, the state has 7 percent or less reserve. Industry experts estimate that between 15-to 30-percent reserves are required to ensure reliability and stabilize prices. Moreover, FERC and

<sup>34</sup> Source: <http://www.aiso.com/docs/09003a6080/16/59/09003a60801659b5.pdf>

the ISO are recognizing the value of creating economic and emergency capacity markets that should stimulate significant demand response programs and incentives to invest in distributed generation.<sup>35</sup>

The State of California also has to realize the need to stimulate more in-state generation to avoid price volatility in the coming years. Currently, the investment community considers California high risk for the development of power plants and investments. Unless new initiatives and proposals from state and federal authorities improve current conditions, infrastructure development will remain difficult to accomplish. Also, the state needs to investigate ways to lower the overall cost of infrastructure development in the state. The cost of gas service in California is also very high, in spite of extensive CPUC regulation of intrastate gas movements.

A coherent market design will need to be advocated in multiple forums, including FERC, the CAISO, California Public Utilities Commission (CPUC), California Power Authority (CPA), and California Department of Water Resources (CDWR). New California laws will be needed to facilitate the new design and to replace the many short-term fixes that were legislated to handle immediate crises. While needed at the time, such approaches may be counter-productive in a redesigned market.

While the policy and market development activity is under way at the state and federal level, the region cannot afford to wait for the outcome. Serious consideration must be given to addressing the region's own energy infrastructure development issues. In addition, the region has to take a careful look at its own infrastructure needs and what market models can best serve the region. This may include development of additional hedges or options given the market models being proposed. This does not imply that the region will ever be completely independent of the wholesale market, but the events of the past 2 years show that the risk of total reliance on an open market model without any buffer or options is an unnecessary risk that can be managed.

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<sup>35</sup> The ISO recently approved payments for load reduction in the summer of 2002 and has an Aggregated Distributed Generation Pilot Program (ADGPP) that will aggregate distributed generation units to allow the output to be sold into the market just like any other power source.