CHAPTER 2.0
PURPOSE AND NEED

2.1 PURPOSE AND NEED FOR THE PROPOSED PROJECT

Californians have learned from painful experience during the 2000-2001 electricity crisis that the market for electricity in California is susceptible to volatile commodity prices, the exercise of market power, and the risk of supply shortages. Development of new transmission facilities to gain greater access to generation may help California avoid or limit similar experiences. Additionally, development of new transmission facilities to areas where generation has been more easily sited and constructed may spur development of new competitive generation to provide further insurance against future electricity crises.

The objectives for building DPV2 are to:

- Increase California's access to low-cost energy by adding 1,200 MW of transmission import capability into California from the Southwest. This is expected to substantially benefit California by reducing energy costs.
- Enhance competition among generating companies supplying energy to California.
- Provide additional transmission infrastructure to support and provide an incentive for the development of future energy suppliers selling energy into the California energy market.
- Provide increased reliability of supply, insurance value against extreme events, and flexibility in operating California's transmission grid.

These objectives are discussed below and in Section 2.2.5.

2.1.1 Increase California's Transmission Import Capability

DPV2 will increase California's transmission import capability by 1,200 MW providing greater access to sources of low-cost energy currently operating in the Southwest. The Southwest region

currently has over 6,000 MW of surplus generation, which may be imported into California. The Southwest Transmission Expansion Planning (STEP)[1] working group independently concluded a similar magnitude of generation is available for import into California. Increased access to energy in the Southwest is forecasted to lower total energy costs and substantially benefit California consumers. As described in Section 2.2 below, SCE's economic analysis, with conservative assumptions, demonstrates that DPV2 provides $1.1 billion of benefits to California consumers over the life of the project, and has a benefit-to-cost ratio of 1.7:1.

2.1.2 Enhance the Competitive Energy Market

As a public policy matter, SCE believes it is in California's interest to encourage investment in new generation infrastructure through (1) the construction of needed high-voltage transmission lines and (2) through reducing the time to permit such transmission lines. For example, on May 8, 2004, regulatory agencies in California adopted the *Energy Action Plan* for California. The *Energy Action Plan* concluded that adequate, reliable, and reasonably priced energy supplies can be achieved, in part, by upgrading and expanding the electricity transmission and distribution infrastructure and reducing the time needed before facilities are brought on line.[2] In particular, "Action IV" of the *Energy Action Plan* states that ([t]he State will reinvigorate its planning, permitting, and funding processes to assure that necessary improvements and expansions to the bulk electricity grid are made on a timely basis."

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1 STEP's Purpose and Scope states "Southwest Transmission Expansion Plan (STEP) is a sub-regional planning group that was formed to address transmission concerns in the Arizona, southern Nevada, southern California, and northern Mexico area. As a result of a large amount of new generation developed in this area, it was apparent to many that the transmission grid would be inadequate to efficiently deliver that power to the major load areas. The goal of STEP is "To provide a forum where all interested parties are encouraged to participate in the planning, coordination, and implementation of a robust transmission system between the Arizona, Nevada, Mexico, and southern California areas that is capable of supporting a competitive efficient and seamless west-side wholesale electricity market while meeting established reliability standards."(See, Jan. 17th 2003 PDF file at: http://www1.caiso.com/docs/2003/01/22/2003012211380012544.pdf and the May 8th, 2003 document at http://www1.caiso.com/docs/2003/05/13/2003051315061917183.pdf.)

2 The California Energy Commission's Electricity and Natural Gas Infrastructure Assessment Report (December 2003) available at www.energy.ca.gov (http://www.energy.ca.gov/reports/100-03-014F.PDF). Similarly, the report highlights the need for additional transmission infrastructure investment, particularly to support generation infrastructure.

Transmission infrastructure is necessary for a competitive market, and is vital to integrating new generation additions.[3] The Federal Energy Regulatory Commission (FERC) recently stated that FERC's Goal 1 is to "Promote a Secure, High Quality Environmentally Responsible Infrastructure through Consistent Policies." Under this goal is objective 1.1:

> Expedite appropriate infrastructure development to ensure sufficient energy supplies; and
>
> Identify transmission and pipeline projects with high public interest benefits and facilitate their speedy completion, consistent with the Commission's (FERC) statutory mandates and due process.[4]

The California Legislature, likewise, has encouraged investment in transmission facilities to facilitate competition in the generation market. It has stated that reasonable expenditures to expand transmission facilities are in the public's interest, if made for the purpose of facilitating competition in electric generation markets.[5]

DPV2 is expected to enhance competition amongst energy suppliers by increasing access to the California energy market, providing siting incentives for future energy suppliers, and providing additional import capability. Facilitating a competitive energy market in the Southwest may also create employment opportunities, which are beneficial to the economy and industries in Arizona and California.

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3 See, R.04-01-026, Order Instituting Rulemaking on policies and practices for the Commission's transmission assessment process (January 28, 2004) (Attachment B, Report of Current Planning Process for Investor-Owned Utilities).

4 See, Federal Energy Regulatory Commission Strategic Plan FY2004-FY2008, September 10, 2003, http://ferc.gov/about/strat-docs/09-29-03-detail-strategic-plan.pdf.

5 Cal. Pub. Util. Code § 454.1 ("(a) Reasonable expenditures by transmission owners that are electrical corporations to plan, design, and engineer reconfiguration, replacement, or expansion of transmission facilities are in the public interest and are deemed prudent if made for the purpose of facilitating competition in electric generation markets, ensuring open access and comparable service, or maintaining or enhancing reliability, whether or not these expenditures are for transmission facilities that become operational.")

2.1.3 Support the Energy Market in the Southwest

The Western Electricity Coordinating Council (WECC) transmission system is an interstate regional system (including Northwestern Mexico and Western Canadian provinces) that links power generation resources with customer loads in a complex electrical network. DPV2 will expand this network and increase the ability for California and the Southwest to pool resources for ancillary services, and provide emergency support in the event of generating unit outages or natural disasters. DPV2 will also provide insurance against major contingencies such as the emergency outage of a major generating facility or of another high-voltage transmission line; i.e., DPV2 will provide a hedge against low-probability, high-severity events such as short- and long-term outages of generating facilities, substations, and transmission lines. For example, if an earthquake disabled lines from the Pacific Northwest into California, then a line importing power from the Southwest, such as DPV2, would provide significant benefits above what is quantified by DPV2's economic analysis. In fact, some experts conclude that past experience demonstrates that high-voltage transmission lines can pay for themselves in just a few years because of the benefits they provide during low probability, high-impact events.[6]

2.2 SCE's ECONOMIC ANALYSIS

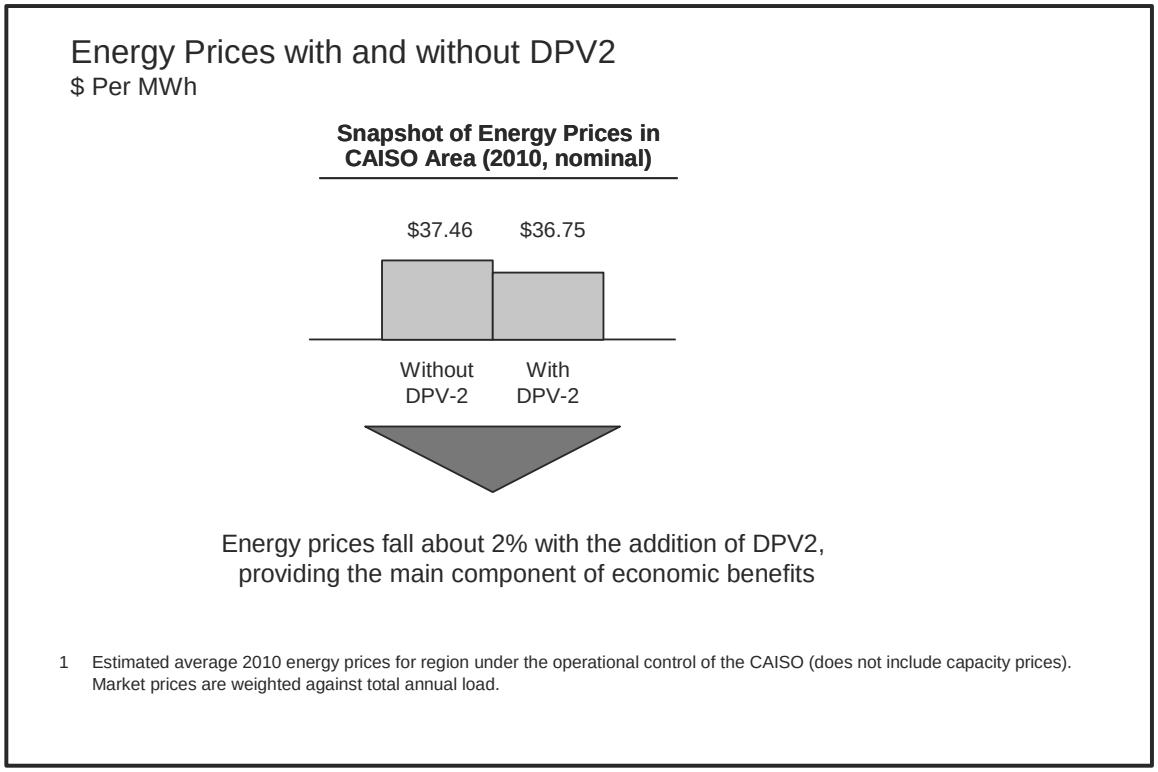
SCE examined DPV2's impact on total production costs, and uncertainty of major assumptions to determine the project's expected economics. Using production cost models, SCE estimated total production costs in California with and without the project and found that total energy production costs for electricity consumers in the CAISO area would be over $1 billion lower with the project than they would otherwise be without the project. SCE determined that the lifecycle benefits of DPV2 are greater than the lifecycle costs of constructing and operating DPV2.

[6] http://www.electricpowergroup.com/Downloads/Planning/Planning_CA_FutureTrans_Grid_Final_Task1.pdf

To provide confidence in these results, SCE analyzed DPV2's benefits over a wide range of load forecasts, natural gas prices, and available hydro-generation, providing ample analysis of volatility affects. This analysis was performed using stochastic tools (also known as Monte Carlo Analysis). This type of analysis is important as it provides an expected value of benefits over a wide range of possible futures. Section 2.2.2 describes SCE's cost-effectiveness analysis of DPV2 which illustrates DPV2's benefit-to-cost ratio is 1.7:1. Appendix G-1 and Appendix G-2 provide additional information regarding SCE's cost-effectiveness analysis of DPV2.

DPV2's economic benefits are largely derived from lowering California energy costs. Figure 2-1 below illustrates that constructing DPV2 is expected to significantly lower energy prices for ratepayers in the CAISO area.

FIGURE 2-1
IMPACT OF DPV2 ON ENERGY PRICES



2.2.1 Description of Assumptions

SCE first evaluated DPV2 in the context of its July 2004 LTPP,[7] which identifies the baseline assumptions used in the benefits analysis of DPV2. The baseline assumptions were designed around the overall intent and "loading order" of the joint agency Energy Action Plan[8]. The 2004 LTPP was found reasonable and adopted[9] by the CPUC on December 16, 2004, subject to modifications that do not significantly affect the need, timing, or cost effectiveness analysis of DPV2.

For the analysis submitted herein, SCE updated the LTPP assumptions for gas prices, loads, and resources to better reflect more recent forecast conditions. In addition, SCE incorporated in this analysis as many of the Commission directed modifications as appropriate in order to maintain consistency with other regulatory forums that also make use of SCE's 2004 LTPP assumptions and analysis.[10] Those modifications include the acceleration of resource adequacy requirements from 2008 to 2006, updated natural gas prices, and updated procurement activities since the initial filing. In addition to these modifications, the 2004 LTPP also was updated for announced resource additions and retirements (generation and transmission alike), load forecasts throughout the WECC, and generic resource additions due to changes in the load forecast. Major assumptions in the adopted 2004 LTPP include:[11]

- SCE meeting 20 percent Renewable Portfolio Standard by 2010 per the Energy Action Plan

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7 Rulemaking (R.) 04-04-003. SCE's LTPP can be found at http://www3.sce.com/law/cpucproceedings.nsf/vwUFiling?SearchView&Query=long+term+procurement+plan&Start=1&Count=30. Specifically, the analysis performed to evaluate DPV2's economics ties directly to SCE's Medium Load Scenario.

8 State of California Energy Action Plan, adopted May 8, 2003. http://www.energy.ca.gov/energy_action_plan.

9 Decision (D.)04-12-048.

10 For example, the California Energy Commission's IEPR Compliance Filing (Docket 04-IEP-1D), Advanced Metering Initiative (R.02-06-001), and the SCE's 2006 General Rate Case, Phase 2 (A.04-12-014).

11 A more detailed description of SCE's LTPP can be found in Rulemaking (R.)04-04-003.

- Mohave Generating Station Units No.1 and 2 shutdown on December 31, 2005
- Mountainview Generating Station operational by summer of 2006
- San Onofre Nuclear Generating Station (SONGS) steam generator replacement in 2009-2010 time frame
- Compliance with Southern California Import Transmission nomogram import limits
- Significant increases in cost effective energy efficiency and demand response programs

2.2.2 Results of the Economic Analysis

DPV2's transmission revenue requirement will be paid by ratepayers of utilities (Participating Transmission Owners, or PTOs) whose facilities are under the operational control of the CAISO. The impact to ratepayers in the CAISO's area is shown in the Figure 2-2 below. SCE estimated benefits and revenue requirements based upon DPV2's estimated average service life.

FIGURE 2-2
DPV2 PROJECTED LIFECYCLE BENEFITS
(2005 NPV, $ Millions, 10.5% Discount Rate Per Annum)

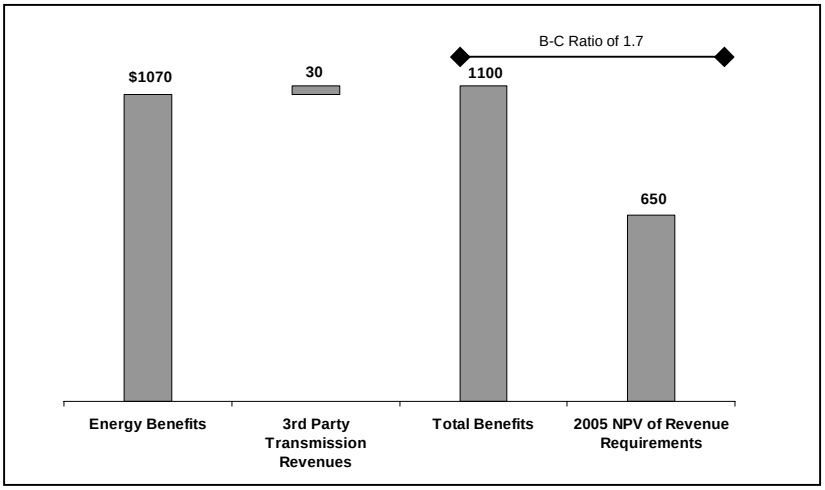

Figure 2-2 illustrates that the economic benefit of DPV2 is $1.1 billion, comprised of energy cost savings, and third-party transmission use revenues. With the addition of DPV2, the revenue requirement used to develop rates for both CAISO wheeling service and Existing Transmission Contracts will increase, and the benefit calculation reflects the increasing revenues from existing

and forecast transmission service users. Edison estimates wheeling service and Existing Transmission Contracts' (ETCs) benefits will provide approximately $0.6 million annually of increased revenue to SCE from certain ETCs and approximately $2.4 million annually of increased CAISO wheeling revenues to SCE or about $30 million (2005 NPV) over the life of the project. This estimate includes only the revenues to SCE, and does not reflect increased revenues to other CAISO entities. If these revenues were taken into account, the benefit would be greater.

The 2005 present value revenue requirement for DPV2 is estimated at $650 million. With a benefit-to-cost ratio of about 1.7:1, DPV2 is a highly cost-effective project for ratepayers in the CAISO area.[12] Appendix G-1 and Appendix G-2 provides additional details regarding SCE's cost-effectiveness analysis of DPV2.

2.2.3 CAISO's Evaluation of DPV2

DPV2 is an economic transmission project as described under Section 3.2.1.1 of the CAISO Tariff. As provided in Section 3 of the CAISO Tariff, SCE submitted a report to the CAISO for their use in evaluating the cost-effectiveness of constructing the Devers-Palo Verde No. 2 Transmission Project.[13] The original report, and a revision to reflect updated assumptions, are included in Appendix G-1 and Appendix G-2. SCE's analysis conformed to the principles and methods the CAISO has outlined in its Transmission Economic Assessment Methodology (TEAM), and demonstrates that DPV2 is cost effective to ratepayers in the CAISO area.

The CAISO conducted an independent review of DPV2 and also found the DPV2 project to be a necessary and cost-effective addition to the CAISO controlled grid.[14] The CAISO Board approved the DPV2 project on February 24, 2005 and directed SCE to proceed with the

12 Ratepayers in the CAISO area are those served by utilities, which are CAISO Participating Transmission Owners who have placed their transmission facilities under the operational control of the CAISO.

13 On April 7, 2004, SCE provided a report entitled "Devers-Palo Verde No. 2 Cost-Effectiveness Report".

14 http://www.caiso.com/docs/09003a6080/34/e4/09003a608034e440.pdf.

permitting and construction of the transmission project, preferably to the completed by the summer of 2009.

2.2.4 Alternatives that SCE Considered

The California Environmental Quality Act (CEQA) requires the project proponent to evaluate alternatives to the project that could meet the project's objectives.[15] Alternatives to DPV2 were identified and evaluated in accordance with CEQA Guidelines. CEQA Guidelines (Section 15126(a)) state:

> An environmental impact report (EIR) shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.

CEQA Guidelines (Section 15364) define feasibility as:

> …capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Chapter 3 discusses alternative routes that were considered for the project. Additionally, SCE evaluated several other potential transmission projects, which could meet SCE's objectives of increasing transmission import capability into California and accessing surplus, low-cost energy in the southwestern United States. SCE also considered generation and demand reduction as possible substitutes for the DPV2 project. These projects are discussed below.

[15] CCR Title 14, Division 6, Chapter 3, Section 15126.6(f).

2.2.4.1 Transmission Alternatives

The following transmission projects were identified as potentially meeting the basic objectives of DPV2:

- Second Southwest Power Link 500kV transmission line
- Upgrades to Southwest Powerlink No. 1, Devers-Palo Verde No. 1 (DPV1), Navajo-Crystal, and Moenkopi-Eldorado 500kV transmission line series capacitors, known as the Path 49 Upgrade Project
- New Imperial Valley-Devers 500kV transmission line (IV-Devers)
- Combination of Imperial Valley-Devers and Series Capacitors Path 49 Upgrade Project

These projects, and DPV2, were screened using production simulations to determine their economic benefits. Only DPV2 and the Path 49 Upgrade Project showed sufficient economic benefits to be evaluated further (i.e., net positive benefits). The other projects had benefit-cost ratios of less than one so they were screened out from further analysis. See, Appendix G-1 and Appendix G-2 for more details regarding this screening analysis. The Path 49 Upgrade Project has been approved by the CAISO and engineering and construction activities have begun. SCE's economic analysis of DPV2 assumes that the Path 49 Upgrade Project is constructed.

The STEP working group also evaluated potential transmission alternatives to DPV2. In its July 11, 2003 Final report on potential 500kV transmission alternatives,[16] the STEP group evaluated 26 transmission alternatives to determine the preferred projects for expanding transmission capacity between the Southwest and California. In addition, after this thorough stakeholder process that started in 2002, the CAISO concluded in 2005 that DPV2 is a "…necessary and cost effective addition to the CAISO Controlled Grid…"[17]. SCE participated in this multi-year stakeholder process and supports its recommendation that DPV2 is a necessary project as compared to other potential transmission alternatives.

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[16] See, the document on the CAISO's web site located at: http://www2.caiso.com/docs/2003/07/11/2003071114390719585.pdf.

[17] http://www.caiso.com/docs/09003a6080/34/e4/09003a608034e440.pdf.

2.2.4.2 Technical Alternatives

In 2003, SCE performed power system technical studies to evaluate how to increase the East of the [Colorado] River (EOR) transfer capability. The levels evaluated were 1,050 MW, 1,200 MW, 1,500 MW, and 2,400 MW. When performing power system technical studies, it is SCE's practice to use the North American Electric Reliability Council ("NERC"), WECC Planning Standards ("NERC/WECC Planning Standards"), and the CAISO's Planning Standards as the system performance standards.

First, a 1,050 MW increase was evaluated to determine if the west of Devers upgrades could be avoided. However, the studies found that west of Devers upgrades would be needed because the Devers-San Bernardino No. 1 230kV line continued to be overloaded at the 1,050 MW transfer capability increase amount. The 1,500 MW and 2,400 MW levels were likewise evaluated but were also found to require significant amount of voltage support and upgrades west of Devers to support such an increase in transfer capability. Therefore, these three levels of increased transfer capability were excluded from further evaluation.

The technical studies focused on fully developing the Plan of Service for a 1,200 MW increase in transfer capability on the EOR and WOR path due to the DPV2 Project being constructed. The 1,200 MW increase was the level of increase that provided the most cost effective Plan of Service to meet the objectives of the Project.

Alternative technical modifications to the existing DPV1 500kV transmission line were evaluated and include: (1) increasing the percent compensation on the existing DPV1 500kV transmission line, and (2) converting DPV1 from an AC line to a DC line.

The DPV1 increase in percent compensation evaluation assessed the potential for Subsynchronous Resonance (SSR) concerns for the Palo Verde generators. The potential for SSR concerns was evaluated with DPV1 at its present 47 percent compensation and at compensation levels from 50 percent to 70 percent increasing in 5 percent increments. The results of this SSR

study clearly demonstrated that an SSR concern for the Palo Verde nuclear generating units would be present at compensation levels at and greater than 50 percent. Based on this result, this alternative was dismissed and not evaluated any further.

SCE performed a scoping study in 2002 to evaluate converting the existing DPV1 AC line to 3,000 MW, +/-500kV HVDC line. It was assumed that the existing AC line could be converted for HVDC operation with two of the three phases operating as the DC poles for the DC operation, and the remaining phase act as the ground return.

Based on the preliminary power flow and stability studies, the project scope of the DC Alternative was identified as follows:

- Palo Verde Substation: Install a converter and associated filters for 3,000 MW
- Devers Substation: Install a converter and associated filters for 3,000 MW HVDC operation
- Build a new Devers-Valley #2 500kV transmission line
- Build a new Valley-Serrano # 2 500kV transmission line
- Drop load at eight SCE A bank stations
- Drop generation in Arizona for the loss of DC line

This DC Alternative was eliminated from further evaluation due to the higher cost when compared to the DPV2 Project.

2.2.4.3 Non-Transmission Alternatives

SCE considered several supply-side and demand-side alternatives to DPV2. Supply-side alternatives include new generation, both conventional and renewable. Demand-side alternatives include additional demand response and energy efficiency. Distributed generation was also considered, as well as the no-project alternative.

SCE concurs with the CAISO[18] that both generation and transmission options need to be pursued to meet future customer demand. SCE does not rely entirely on one or the other, but rather a portfolio that integrates both. Generation and transmission options have differing attributes that help meet the needs of a load-serving entity. For example, generation provides local-area reliability such as voltage support and black/quick-start, whereas transmission provides access to multiple generators and enhances liquidity in the market and market competition.[19] Both options are necessary, and DPV2 is the specific transmission project that is being considered here.

The alternatives discussed below are resource options SCE is aggressively pursuing[20] to meet the demands of its customers and southern California in general. As shown by the "in-out" analysis,[21] these resources are complimentary to the future benefits of DPV2 and therefore are not substitutes. Nevertheless, all of the non-transmission alternatives were eliminated from consideration because they do not meet the project's objectives of (1) increasing access to low-cost, surplus generation in the Southwest by adding 1,200 MW of transmission import capability into California and reducing energy costs in California; (2) enhancing competition among generating companies supplying energy to California; (3) providing additional transmission infrastructure to support and provide an incentive for the development of future energy suppliers selling energy into California; and (4) providing increased reliability of supply, insurance value against extreme events, and flexibility in operating California's transmission grid.

New Generation Alternatives

A project to construct an economic transmission line is not comparable to generation, either conventional or renewable. First, an economic transmission line provides access to many generators, which will increase competition and broaden the energy market. DPV2 will facilitate a robust transmission system that will not only allow for interconnection of new generation

18 CAISO report on Economic Evaluation of Palo Verde Devers No. 2, February 2, 2005.

19 DPV2 does not preclude the development of new generation.

20 SCE prioritizes its resource considerations consistent with the Energy Action Plan's "loading order."

21 A more detailed discussion may be found in Appendix G of the PEA.

resources to the transmission grid, but also will provide for flexible delivery alternatives and increase access to a greater number of resource procurement options.

Second, a transmission line such as DPV2 will allow load serving entities to procure short-, medium-, and long-term contracts with existing low-cost generation from the Southwest in addition to only long-term contracting associated with a new generation alternative located in southern California. As discussed in Section 2.1.1, there are over 6,000 MW of existing surplus generation in the Southwest. New generating plant 'alternatives' in southern California would likely require long-term contracts to meet financing requirements to be built and would likely have their full output secured through the contracts.[22] In this scenario, these generating plants would not participate in the short-term energy markets and produce the enhanced competition DPV2 is expected to facilitate. Renewable resources, in particular, tend to rely even more on dedicated, long-term, full-requirement contracts. SCE is not aware of any renewable generation projects in southern California in which only a portion of its full capacity is secured by contract, and the remaining capacity is sold on a merchant basis.

When considering new generation alternatives, one should also consider whether new transmission is required to deliver the power to the load. DPV2 does not preclude the development of new power, renewable or otherwise. On the contrary, as load continues to grow, DPV2 can provide the additional means for new generation to be delivered to the load.[23]

[22] SCE's experience has been that the current market environment prefers new generating plants in southern California to secure all or most of its full output by a long-term contract to obtain financing. As indicated in various parties' testimony in the R.04-04-003 (see, for example, witness Kelly of the Independent Energy Producers, transcript p.1036), it is currently difficult to finance new power development without a long term contract.

[23] Even if DPV2 is fully utilized, new cost effective generation can compete with existing generation for access to DPV2 transmission.

Furthermore, the economics of new generation in the Palo Verde area have historically been lower relative to new generation in southern California due to the following factors:

- Lower cost of delivered natural gas
- Lower labor rates
- Lower cost for bulk materials purchased locally (including state taxes)
- Lower costs for emissions offsets/credits
- Lower land costs

SCE believes these factors will continue into the future therefore providing a lower-cost energy option to California consumers.

SCE specifically considered the solar and wind renewable generation as alternatives to this project. Generation from either technology is categorically "as available" and therefore does not provide the dispatch flexibility that resources delivered via DPV2 can potentially provide. Nevertheless, SCE's evaluation of DPV2 assumes full compliance with California's Renewable Portfolio Standard, in which SCE plans to meet the statutory requirement that 20 percent of its retail energy load be met by renewable generation and a significant portion of this goal is expected to be met through wind and solar generation. Moreover, SCE's future procurement activities will consider additional cost-effective renewable resources that go beyond the 20 percent statutory requirement.

For these reasons, new generation alternatives do not meet the project's objectives and were excluded from further evaluation.

Demand-Response Alternative

Demand response represents a small fraction of the total capacity requirement needed to meet SCE's import and supply reliability objectives. As a stand-alone alternative to DPV2, these

programs cannot meet the growing electricity demands of California for two main reasons. First, SCE's 2004 LTPP already includes the maximum amount of approved demand response investments over the next ten years, amounting to approximately 1,400 MW of peak load reduction by 2014. Even with the amount of demand response SCE is planning to implement, DPV2 is still a cost effective project. Second, demand response programs are resources that are designed to primarily provide capacity benefits and not low-cost energy benefits such as DPV2. While SCE supports the Commission's "loading order" and is aggressively pursuing demand-side programs before other resource alternatives, implementation of additional demand response over-and-above what is currently planned in SCE's service territory that match the size and scale of DPV2 is unlikely. Instead, new supply resources and/or increased access to new supply resources via transmission are needed in addition to demand response investments. For these reasons, the demand response alternative does not meet the project's objectives and was excluded from further evaluation.

Energy Efficiency Alternative

SCE's 2004 LTPP already includes the maximum reliably achievable amount of cost effective energy efficiency, amounting to nearly 6 billion kWh reduction in sales over and above what is currently implemented over the next ten years and therefore is not an alternative to DPV2. In fact, DPV2 is still a cost effective project even with the amount of energy efficiency SCE is planning to implement. Finally, for similar reasons as the demand response alternative discussed above, the energy efficiency alternative does not meet the project's objectives and was excluded from further evaluation.

Distributed Generation Alternative

As stated in SCE's 2004 LTPP[24], SCE supports the integration of cost-effective distributed generation as both a demand-side and grid-side resource. SCE's 2004 LTPP forecasts a 6 percent annual growth in distributed generation resources[25] exceeding the Energy Action Plan goal of 1 percent growth per year. Note, however, most distributed generation facilities are very small, averaging less than 0.1 MW per facility. It does not appear to be feasible to construct and operate a distributed generation alternative in sufficient quantity to meet projected demand growth that can be served by the large-scale generation in the Palo Verde area. For these reasons, the distributed generation alternative does not meet the project's objectives and was excluded from further evaluation.

No-Project Alternative

Should DPV2 not be completed or should it be delayed indefinitely, the net economic benefits that would have been derived from DPV2's access to surplus, low-cost generation in the Southwest would not materialize. This was demonstrated in the DPV2 "in-out" analysis,[26] which shows SCE purchasing more, higher-cost energy from within the state and importing less economy energy from the Southwest without DPV2. Also, the potential benefits of increased competition within the generation sector would be lost. And finally, the added operational benefits needed during a major generation or transmission outage would not be available.[27] The no-project alternative would mean that DPV2 would not be built, an alternative that does not meet the basic project objectives. As such, the no-project alternative was excluded from further

24 See, R.04-04-003 Volume 1 at 81.

25 SCE has over 3500 distributed generation sites with a combined capacity of about 255 MW, which have been approved/authorized since 2001.

26 A more detailed discussion may be found in Section 2.2 of the PEA.

27 A more detailed discussion may be found in Section 2.2.5 of this Chapter 2.0.

economic evaluation, but it was analyzed as part of the environmental analyses in SCE's application and PEA.

2.2.5 Non-Quantifiable Benefits

Some examples of potential benefits not quantified in DPV2's benefit-to-cost ratio of 1.7:1 include:

- New Generation Development – Developing the DPV2 could attract new generation development east of Devers Substation, such as in the Blythe and Palo Verde areas, providing additional supply to the California energy market. If new generation is developed, then DPV2's benefits should increase due to increased access to this new low-cost generation.

- Market Power – DPV2 also may provide benefits by reducing the potential for generators to exercise market power. By helping to increase the quantity of generation and number of suppliers available to serve California markets, DPV2 should help to increase competitive pressure on generators. This, in turn, should help to reduce the ability for generators to exercise market power as California experienced in the recent energy crisis.

- Emergency Value – A new transmission line such as DPV2 could provide benefits during an emergency outage of another major import line or generating facility. For instance, if fire or an earthquake disables lines from the Pacific Northwest into California, then a line importing power from the Southwest, such as DPV2, would provide benefits above what is quantified in this report. A similar emergency value could accrue during the long term or untimely outage of generation located in Southern California.

Using a production simulation modeling assessment to evaluate a transmission project will undervalue a transmission project, since it will not capture the benefits listed above. These

benefits are difficult to quantify because they involve uncertainties that are hard to predict. But historically, transmission lines can pay for themselves in just a few years because of low probability, but high-impact events.[28]

DPV2 provides very real economic benefit to ratepayers by providing access to low-cost energy, supporting SCE's energy procurement goals, and enabling competitive new generation to develop, and providing significant operational benefits because grid operators have more facilities in which to depend upon (as discussed in Section 2.2).

2.3 THIRD-PARTY PROJECT PARTICIPATION AND RELATED TRANSACTIONAL ISSUES

2.3.1 Los Angeles Department of Water and Power

SCE and the Los Angeles Department of Water and Power (LADWP) currently have an existing contractual arrangement that provides for participation by LADWP in the DPV2 project. The Los Angeles-Edison Exchange Agreement was entered into on December 18, 1987 (Exchange Agreement). The Exchange Agreement is summarized in Table 2-1.

Under the Exchange Agreement, LADWP will receive 30.7 percent of the DPV2 line capacity and share in 30.7 percent of the DPV2 project costs. The Exchange Agreement provides that the parties will enter into a participation agreement to more fully describe the parties' respective rights and obligations regarding the ownership of DPV2. Provided LADWP participates in DPV2, its transmission capacity between Palo Verde and Devers will remain essentially the same. LADWP's 368 MW of existing transmission service rights between Devers and Palo Verde will terminate and LADWP will acquire a 30.7 ownership interest in DPV2. LADWP's ownership share would equal 368 MW at the planned rating for DPV2 of 1200 MW.

[28] http://www.electricpowergroup.com/Downloads/Planning/Planning_CA_FutureTrans_Grid_Final_Task1.pdf.

TABLE 2-1 SUMMARY OF EXCHANGE AGREEMENT
Eastern Transmission Service SCE shall make available to LADWP 368 MW of firm bidirectional transmission service between Devers and Sylmar for the life of DPV1 or upon construction of DPV2 the life of DPV2. SCE shall make available to LADWP 368 MW of firm bidirectional transmission service between Palo Verde and Devers beginning June 1, 1990 and shall continue service until the earliest of any of the following events: (i) the in-service date of the DPV2 Line, (ii) the in-service date of any other transmission line connecting Palo Verde and Devers in which LADWP has obtained either an ownership share or entitlement to transmission service, (iii) the date when the DPV1 Line is permanently removed from service, (iv) four years after SCE has obtained the CPUC approval, pursuant to California Public Utilities Code Section 851 to transfer rights of way for DPV2 to LADWP, or (v) upon 12 months' prior written notice by LADWP, on or after January 1, 2003; provided, however, that upon written notice by SCE, provided within three months following the date of such notice by LADWP, such termination date may be extended for an additional period not to exceed 24 months, if and to the extent necessary to allow SCE to reflect fully the revenue impact of such termination in its CPUC and FERC jurisdictional rates. SCE shall make available to LADWP 100 MW of firm bidirectional transmission service over SCE's transmission facilities between Palo Verde and Sylmar through May 2012.
Northwest Transmission Rights LADWP shall make available to SCE from LADWP's ownership share of the extra-high voltage (EHV) Pacific DC Intertie Line, 500 MW of firm bidirectional Transmission Capacity on the EHV DC Line between Sylmar and the Nevada-Oregon border. SCE shall make available to LADWP 320 MW of bidirectional Transmission Capacity on the EHV Pacific AC Intertie Lines. The exchange of Pacific Intertie transmission service terminates when SCE's rights to the Pacific AC Intertie terminate.
Castaic Service LADWP shall make available to SCE 200 MW from the Castaic Power Plant for a term of five years from the effective date of the Exchange Agreement. This provision expired on December 18, 1992. Commencing upon the effective date of the Exchange Agreement and continuing for a term of 22 years, LADWP shall use its best efforts to make Additional Service available to SCE at LADWP sole discretion. Additional Service is any weekly service for spinning reserve, generation and pumping purchased by SCE.
DPV2 Line Ownership LADWP has the obligation to acquire a 30.7 percent ownership interest in the DPV2 line. SCE shall use its best efforts to construct DPV2 with a minimum 1,200 MW Transmission Capacity Rating. LADWP has the option to purchase firm bi-directional transmission service over DPV2 to make up a total of 368 MW in the event DPV2 Transmission Capacity Rating is less than 1,200 MW.

LADWP has not yet committed to participate in DPV2. On August 1, 2003, SCE sent a letter to LADWP informing LADWP of SCE's intention to pursue the necessary regulatory approvals for the construction of the DPV2 Line. LADWP responded to SCE with a letter dated September 5, 2003 that LADWP is currently in the process of evaluating its rights and obligations pursuant to the Exchange Agreement. SCE has provided LADWP with DPV2 project information and will continue to seek LADWP's participation. SCE will keep the CPUC informed of significant developments regarding LADWP's participation in DPV2. Participation by LADWP in DPV2 will not change total project benefits because LADWP would effectively be trading its existing transmission service right for an ownership right with no net change in new transmission

capacity available to the CAISO. Project costs to CAISO ratepayers would be reduced by LADWP's payment of its ownership share of costs, and thus LADWP participation in DPV2 will improve SCE's cost-benefit analysis. For purposes of this application, SCE has used a conservative assumption that LADWP will not participate in DPV2.

2.3.2 Harquahala Generating Company Option Agreement

SCE and Harquahala Generating Company (HGC) entered into an Option Agreement on February 13, 2001 (Option Agreement). The Option Agreement provides that SCE has the option to purchase the 500kV switchyard at Harquahala; the 500kV transmission line from the Harquahala Switchyard to the Hassayampa Switchyard, and the Harquahala transmission line terminal facilities at the Hassayampa Switchyard.

SCE also entered into a License Agreement with HGC on February 13, 2001 that provides for HGC to construct a portion of the Hassayampa-Harquahala transmission line on SCE right-of-way. The agreement also allows HGC to purchase SCE's land rights between Harquahala and Hassayampa if SCE does not exercise the option by 2011, or if SCE desires to terminate the License Agreement. If SCE exercises the Option Agreement, the License Agreement would terminate.

At the time SCE entered into the Option Agreement, HGC was proceeding to build and own a 500kV transmission line to interconnect its new 1,040 MW natural gas-fired generating plant in Maricopa County, Arizona, with the regional transmission system in central Arizona at the Hassayampa 500kV switchyard. SCE was concerned with the potential for HGC building near SCE's DPV2 right-of-way and potentially adversely affecting SCE's ability to build DPV2. SCE entered into the Option Agreement with HGC to preserve the right-of-way for DPV2.

For the DPV2 project, SCE will construct a new 500kV line from Devers to the Harquahala switchyard. SCE would then use the existing Harquahala-Hassayampa 500kV line to complete

the connection of the DPV2 Project to the Hassayampa Switchyard. The Hassayampa Switchyard is a satellite switchyard, and is functionally equivalent to connecting at the PVNGS Switchyard. SCE's preferred route and alternatives are discussed in Chapter 3.

2.3.3 Arizona Public Service TS5 Project

APS has informally proposed to the Arizona Corporation Commission (ACC) that it construct a 45 mile 500kV transmission facility from the Palo Verde hub to a new TS5 substation located in western Arizona. APS's preferred route for its proposed TS5 line parallels SCE's Devers-Palo Verde right-of-way for approximately 18 miles. The ACC has encouraged APS to evaluate using existing transmission capacity between Palo Verde and Harquahala. APS has approached SCE to determine if arrangements could be made to utilize the existing Harquahala-Hassayampa 500kV line, which SCE plans to acquire from HGC pursuant to the Option Agreement, to complete the connection of the DPV2 Project to the Hassayampa Switchyard as described above in Section 2.3.2. APS's preliminary studies indicate that there may be adequate capacity in the Harquahala-Hassayampa 500kV line prior to 2015 to accommodate both the TS5 and DPV2 Project requirements. SCE is continuing discussions with APS on a possible joint arrangement. SCE will keep the CPUC informed of significant developments regarding these joint project discussions.

2.4 WEST OF DEVERS UPGRADES

2.4.1 230kV West of Devers Transmission Upgrades

For most of its alignment, the DPV2 500kV transmission line route would be located adjacent to the existing DPV1 500kV transmission line within an established transmission line corridor. DPV2 would become part of the EOR transmission system. The EOR System is a WECC–defined transmission path (Path 49) that consists of six 500kV transmission lines linking southern Nevada and western Arizona with southern California, The EOR system is presently

rated at 7,550 MW. The EOR rating is expected to increase to 8,055 MW in 2006 with the completion of the planned upgrades to DPV1 and the SWPL line (Path 49 Upgrade project).

The addition of the DPV2 500kV transmission line to the EOR system would increase the transfer capability on the EOR system by 1,200 MW, increasing the total rating of the EOR system to 9,255 MW. This increase in transfer capability would result in line-overloads on the four 230kV lines west of the Devers under line-out contingencies.

System planning criteria require that the lines provide sufficient capacity during normal and emergency conditions. The criteria are satisfied during emergency conditions if the remaining lines do not overload when another line (or 2 lines) ”trips” out of service. Due to the increased power flows associated with the proposed DPV2 project, all four of the west of Devers 230kV lines load beyond their loading capability during an outage of the existing Devers- Valley 500kV transmission line. This condition is a violation of system planning criteria.

Therefore, the DPV2 project and specifically, operation of the proposed Devers to Harquahala 500kV transmission line, will require upgrades to SCE’s existing 230kV transmission lines west of the Devers Substation in accordance with applicable system planning criteria.

The west of Devers 230kV system consists of two Devers-San Bernardino lines and two Devers-Vista lines. The Devers-San Bernardino No. 1 and the Devers-Vista No. 1 230kV lines would be upgraded. Those upgrades consist of the removal and replacement of approximately 40 miles of two single-circuit tower lines with a new double-circuit tower line, strung with double-bundled 1033 aluminum conductor steel-reinforced (ACSR) conductors. The single conductors on the existing double-circuit tower lines would be replaced with double-bundled 1033 ACSR conductors. These upgrades would result in four 230kV circuits with double-bundled conductors on two double-circuit tower lines. Minor modifications would be required to some of the towers. Replacing the existing conductors with higher capacity conductors will more than double the capacity of the four 230kV transmission lines west of Devers Substation.

The proposed 230kV upgrades are the most cost-effective and practicable means to resolving the potential system overload conditions by increasing the normal power carrying capacity of the four west of Devers 230kV circuits.

2.4.2 West of Devers Alternatives

Three other system modifications were evaluated as alternatives to the proposed 230kV transmission line upgrades west of Devers: (1) operating mitigation procedures, (2) constructing a new 500kV line, and (3) constructing a new and separate 230kV line (i.e., adding a fifth circuit). These options are described as below.

2.4.2.1 Operating Procedures

If the DPV2 project is constructed without upgrading the transmission system west of Devers, the existing 230kV transmission lines would overload under base case (all lines in-service) and for line out conditions. In the absence of the proposed upgrade project, planned overload mitigation would be required to reduce the loading on the existing lines to below their loading capability. Acceptable mitigation would consist of an operating procedure that would limit the transfer capability on the EOR system. This type of mitigation is not desirable both from the system operation viewpoint and economics because it would reduce the DPV2 power flow on EOR to its present 8055 MW rating; the schedules associated with the 1200 MW rating increase would be reduced to zero.

2.4.2.2 New Devers-Mira Loma 500kV Transmission Line

Adding a new 500kV transmission line between Devers and the Mira Loma substations would resolve the system overload problem identified on the 230kV system west of Devers. However,

building a new 500kV line to prevent the 230kV transmission line overloading would cost more than the proposed 230kV replacement and upgrade west of Devers. Additionally, adding a new 500kV line would not increase the overload capability on the west of Devers 230kV system because the small conductor line would still be there and it is the limiting element to achieve the full 1200 MW transfer capability for the Project. Therefore, for contingency of the new 500kV line, the 230kV lines would overload and an operating procedure would be required to reduce DPV2's 1200 MW import capability to zero.

2.4.2.3 New 230kV Transmission Line

Constructing a new and separate 230kV transmission line west of Devers would increase the base case load carrying capacity of the 230kV transmission system west of Devers. However, it would not increase the overload capability on the existing west of Devers 230kV transmission lines because the small conductor in the lines would still be there and the full 1200 MW transfer capability for the Project could not be achieved. Similar to the discussion in Section 2.4.2.2 above, for the contingency of the new 230kV line, the existing 230kV lines would overload and an operating procedure would be required to reduce DPV2's 1200 MW import capability to zero.

Also, a separate 230kV transmission line cannot be constructed in the existing west of Devers 230kV right-of-way without removal of an existing line, due to the lack of available space.

2.4.3 500kV Static VAR Compensators

A 388 MVAR 500kV Static VAR Compensator (SVC) would be installed and terminated at the 500kV switchyard inside the property line at Devers Substation and one 388 MVAR, 500kV SVC would be installed at SCE's existing Valley Substation. For Valley Substation, the western station fence would be relocated to the western edge of the existing property line. An area of approximately 2.0 acres within the substation property would be used for temporary lay down

and construction. Installing dynamic voltage support equipment is needed to mitigate violations of the voltage stability criteria of the WECC and North American Electric Reliability Council ("NERC") Planning Standards.

2.4.4 Special Protection System

A Special Protection System (SPS) is proposed to mitigate post-transient voltage violations of system planning criteria for the simultaneous loss of Devers-Palo Verde No. 1 and Devers-Harquahala, or Devers-Palo Verde No. 1 and Harquahala-Hassayampa 500kV lines. This SPS will be designed to drop approximately 900 MW of generation in the Palo Verde area and approximately 900MW of SCE load.

2.5 MIDPOINT SUBSTATION

SCE has received an interconnection request from Desert Southwest Power, LLC (DSWP) as the proponent of the Desert Southwest Transmission Project (DSWTP). The proposed DSWTP is a 500kV transmission line that would be constructed parallel to SCE's DPV1 line from Blythe, California to the Devers Substation. In an effort to minimize environmental impacts and project costs, SCE and DSWP have agreed to explore ways to integrate the two projects. Under a joint project proposal, only one, instead of two 500kV transmission lines, would be constructed between Blythe and Devers. The joint project would include the construction of a 500kV switchyard referred to as the Midpoint Substation in the Blythe area. The Midpoint Substation would allow the integration of the DSWTP and the DPV2 Projects. SCE will keep the CPUC informed of significant developments regarding these joint project discussions.