

California Independent System Operator Corporation (California ISO)

Section 2 – California ISO Performance Metrics

The California ISO was created in September 1996 as a nonprofit public benefit corporation with the passage of California Assembly Bill 1890 that restructured the state's power market following the passage of the federal Energy Policy Act of 1992, which introduced competition into the wholesale market. It incorporated in May 1997 and in March 1998 began serving 80 percent of the state, or 30 million people, with the purpose of managing the state's transmission grid, facilitating the spot market for power and performing transmission planning functions.

The California Power Exchange operated the state's competitive wholesale power market and customer choice program until the 2000-2001 energy crisis forced it into bankruptcy in January 2001. The exchange ultimately ceased operation leaving the state without a day-ahead energy market until spring 2009 when the ISO opened a nodal market.

During and immediately after the energy crisis, the ISO began addressing underlying infrastructure challenges — specifically transmission and generation deficiencies — and started a comprehensive market redesign and technology upgrade program with FERC approval. State regulators implemented a resource adequacy obligation in 2004 that prevents under-scheduling so that utilities now must procure in advance 100 percent of their total forecast load as well as a 15 percent margin for a total of 115 percent. Developers have built more than 18,000 megawatts of mainly gas-fired generation in California since the energy crisis. About \$9.5 billion in transmission expansion has been studied and approved by the ISO including the critical Path 15 link between southern and northern California. At start-up, the ISO operated a zonal market and the California Power Exchange operated a day-ahead market. However, on March 31, 2009 (for trading day April 1) the ISO launched a new market design that includes a day-ahead market, locational marginal pricing and relies on a full network model of the grid that analyzes day-ahead energy schedules and “sees” potential choke points on the grid well before they occur. The new fully integrated forward market allows the ISO to purchase the right mix of energy, standby power and transmission capacity to meet grid needs in three time frames (day ahead, hour ahead and real time). The locational marginal pricing feature of the new market shows the true cost of delivering power, including for those areas with transmission constraints, making it easier for the ISO and load serving entities to choose running the right power plant to meet local needs. And this pricing approach provides more granular information about the areas that can benefit most from new infrastructure, as well as give developers better information on which to base their economic decisions.

Under the nodal market for the nine months it operated in 2009, wholesale energy costs declined by 28 percent, and ancillary services costs dropped by 54 percent, in part because of better optimization of the system, greater market liquidity, lower demand and lower natural gas prices. The frequency and impact of bid mitigation on prices was generally low and reflected disciplined behavior by market participants, according to the ISO Department of Market Monitoring. Ancillary services costs dropped from \$0.74/MWh of load in 2008 to \$0.39/MWh in 2009 because the new market allowed generators for the first time to bid all their output into the energy and ancillary services markets at the same time. This increases the supply of bids, enabling the market software to find the most cost-effective way to use each unit's capacity. The new market reflected the increased activity as annual billings went from \$2.4 billion in 2008 to \$6.4 billion in 2009. New day-ahead market optimization created additional opportunities for buying and selling, as did the introduction of new market products.





Since the new market implementation, the California ISO has been taking strategic steps to identify where to add market functionality or refine what already exists. In 2009, the ISO delivered six market enhancements. In addition, the ISO has been focused on facilitating reliable integration of the resources necessary to meet California's renewables portfolio standard. A governor's executive order requires load-serving entities to increase their procurement portfolio to 33 percent by the year 2020. The combined impacts of these two areas touch nearly all of the core functions of the ISO, including operations, markets and infrastructure requirements. While the results of these efforts unfold over the next several years, early indications suggest the ISO is on target to lead the state and region in developing the rules and processes that aid in building clean power plants and the transmission to deliver renewable energy. To this end, the ISO has approved four major transmission projects (Tehachapi Renewable Transmission Project, Sunrise Powerlink, California segment of Devers-Palo Alto II, El Dorado-Ivanpah Substation) with a capacity of 12,300 MW that will mainly transport renewable energy.

A. California ISO Bulk Power System Reliability

The table below identifies which NERC Functional Model registrations the California ISO has submitted as effective as of the end of 2009. The Regional Reliability Organization for the ISO is the Western Electricity Coordinating Council (WECC), as noted at the end of the table with a URL to its specific reliability standards.

At this time, the WECC is the Interchange Authority and Reliability Coordinator for the Western Interconnection, while typically, the transmission owners serve as Transmission Planners and load-serving entities serve as Resource Planners. The ISO performs its Planning Authority functions in accordance with its FERC approved Order No. 890 compliant tariff. As the Planning Authority, much of the ISO's core function involves transmission expansion planning related activities, most notably producing the annual California ISO Transmission Plan.

No California ISO self-reported or audit-identified reliability standard violation was published by NERC or FERC during the 2005-2009 period covered by this report. On February 1, 2010, however, NERC published a Notice of Penalty recommending a \$0 penalty with a sanction letter for an incident self-reported by the California ISO on November 30, 2007. This incident, which took place on October 2, 2007, related to possible noncompliance with IRO-STD-006-0 for a deficiency of providing off-path curtailments of 2.6 MW and 1.7 MW on a 2900 MW rated path. The recommendation was accepted by FERC without further action in a notice dated March 3, 2010.

NERC Functional Model Registration	California ISO
Balancing Authority	
Interchange Authority	
Planning Authority	
Reliability Coordinator	
Resource Planner	
Transmission Operator	
Transmission Planner	
Transmission Service Provider	
Regional Entity	WECC

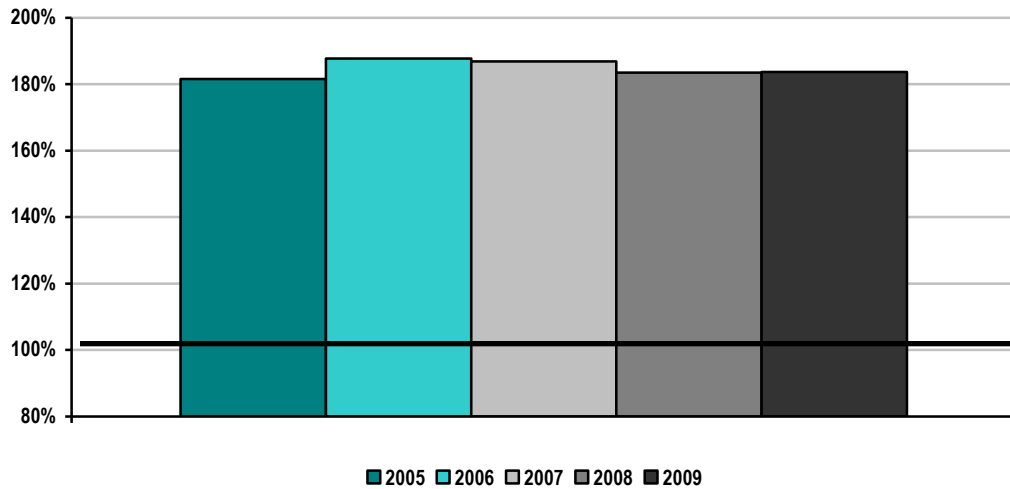
Standards that have been approved by the NERC Board of Trustees are available at:
<http://www.nerc.com/page.php?cid=2|20>

Additional standards approved by the WECC Board are available at:
<http://www.wecc.biz/Standards/Approved%20Standards/Forms/AllItems.aspx>

Dispatch Operations

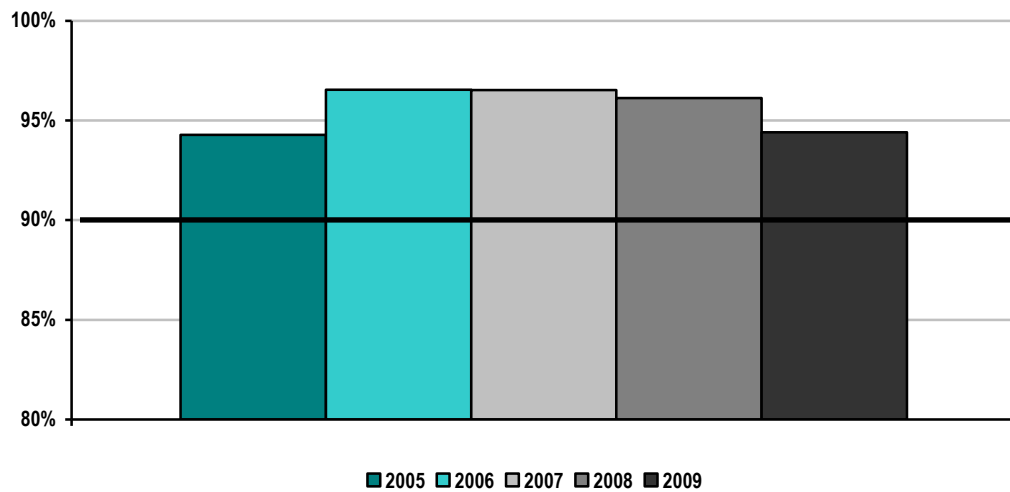
Balancing authority areas are required to maintain compliance of at least 100 percent for CPS-1 over a 12-month period. The California ISO complied with CPS-1 for each of the calendar years from 2005 through 2009, having exceeded the minimum standard by over 80% in each of the five years during this period.

California ISO CPS-1 Compliance 2005-2009



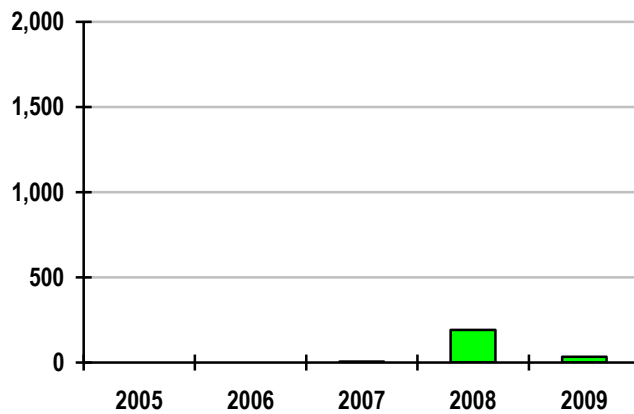
Balancing authority areas are also required to maintain compliance of at least 90% for CPS-2 during each month in a 12-month period. The California ISO complied with CPS-2 from 2005 through 2009, having exceeded the minimum standard on average by about 6%.

California ISO CPS-2 Compliance 2005-2009

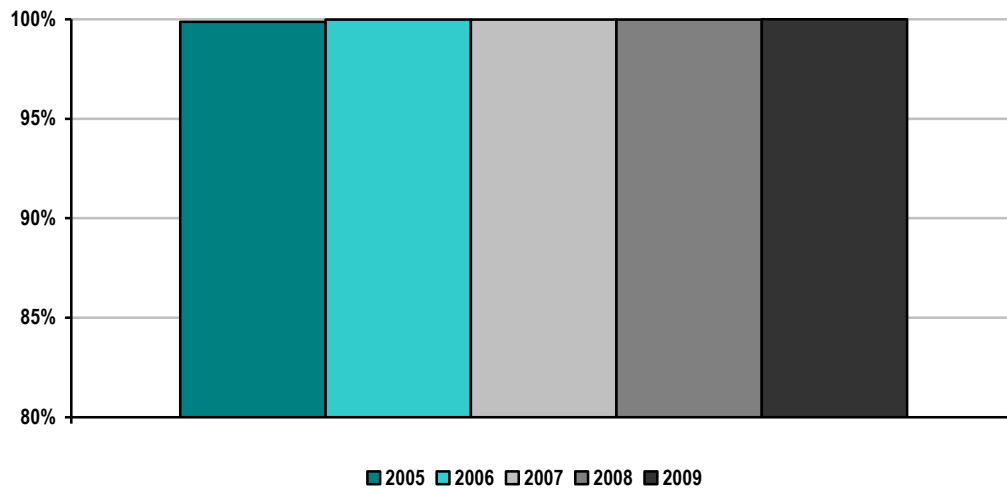


California ISO data reflects the number of unscheduled flow relief events from 2007 commencing June 18, 2007 through December 31, 2009. With respect to the ISO, 16% “no impact” events (i.e., no tag curtailment actions required), 40% involved phase shifter operation and on path tag curtailment actions only and 44% involved both on and off path tag curtailment actions. The large variability in ISO events during this period is primarily attributable to substantially different annual hydro and system conditions throughout the Western Interconnection.

California ISO Transmission Load Relief or Unscheduled Flow Relief Events 2007-2009

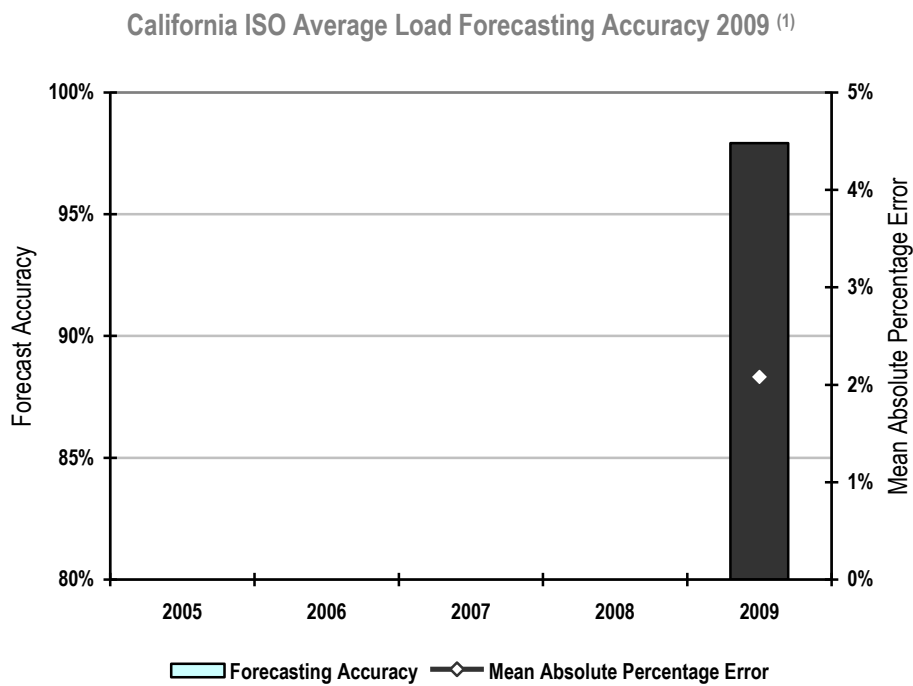


California ISO Energy Management System (EMS) Availability



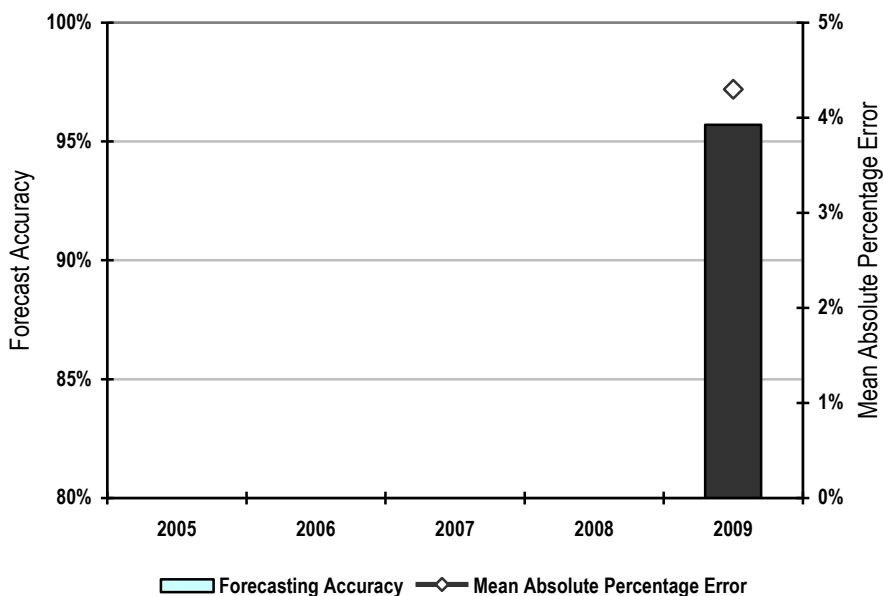
Load Forecast Accuracy

A significant portion of the load in California is centered along the coast in the areas around San Francisco, Los Angeles and San Diego. During the summer period, particularly during peaks, these regions can experience significant changes in temperature from what was predicted in the day-ahead timeframe because of the sometimes sudden and intense marine influence of the Pacific Ocean. These rapid changes are in part responsible for California ISO day-ahead peak load forecasts for the coastal areas being slightly lower than the valley load forecasts. On average the ISO day-ahead load forecast from a reference point of 9:00 a.m. is 98% accurate. Prior to the day-ahead market that started on April 1, 2009, the load forecast was not used by the ISO to make market commitments and therefore the results are not reported. Further the data structure prior to that date was different so the results are not directly comparable.



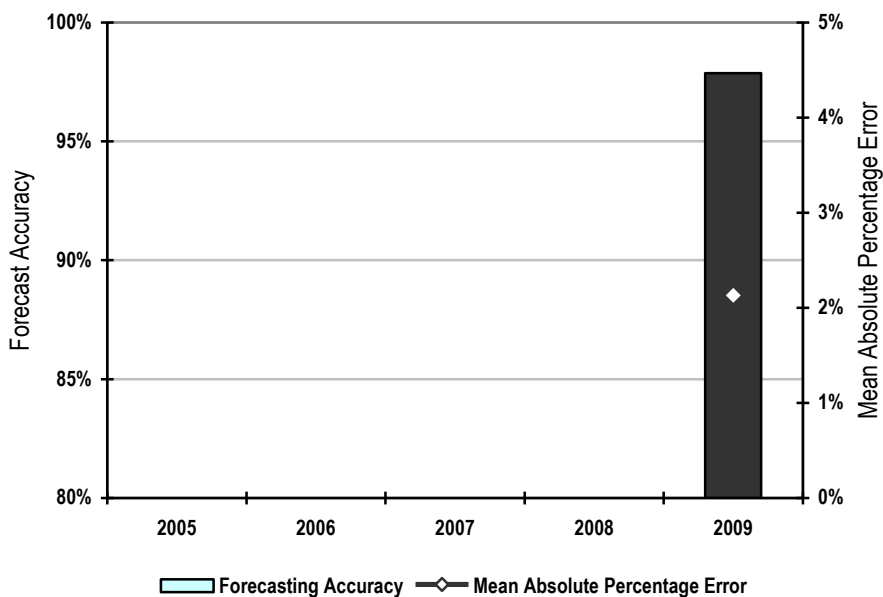
(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

California ISO Peak Load Forecasting Accuracy 2009 ⁽¹⁾



(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

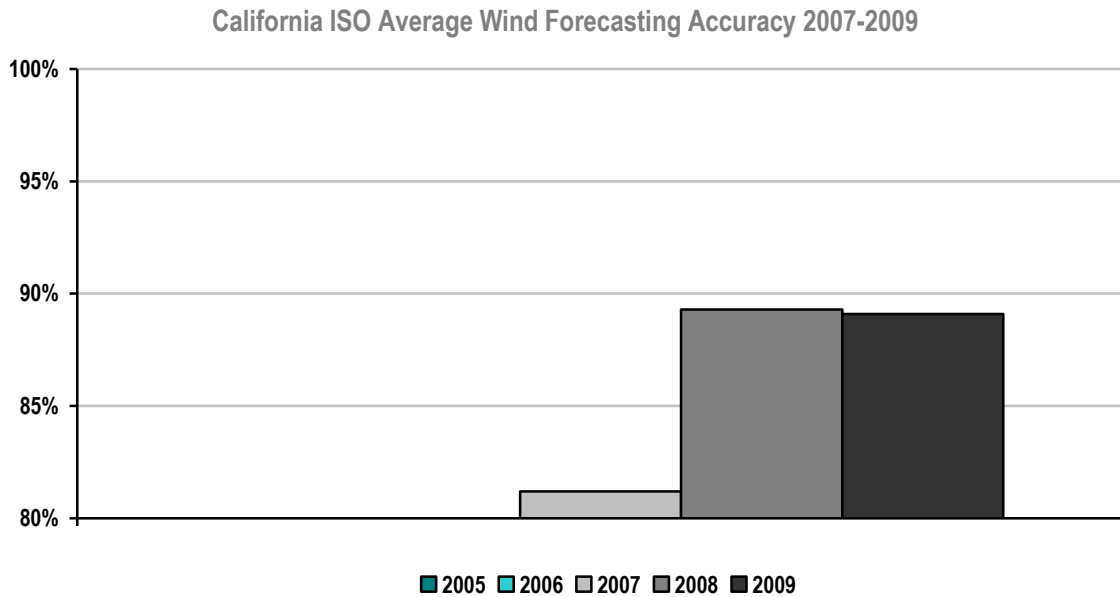
California ISO Valley Load Forecasting Accuracy 2009 ⁽¹⁾



(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Wind Forecasting Accuracy

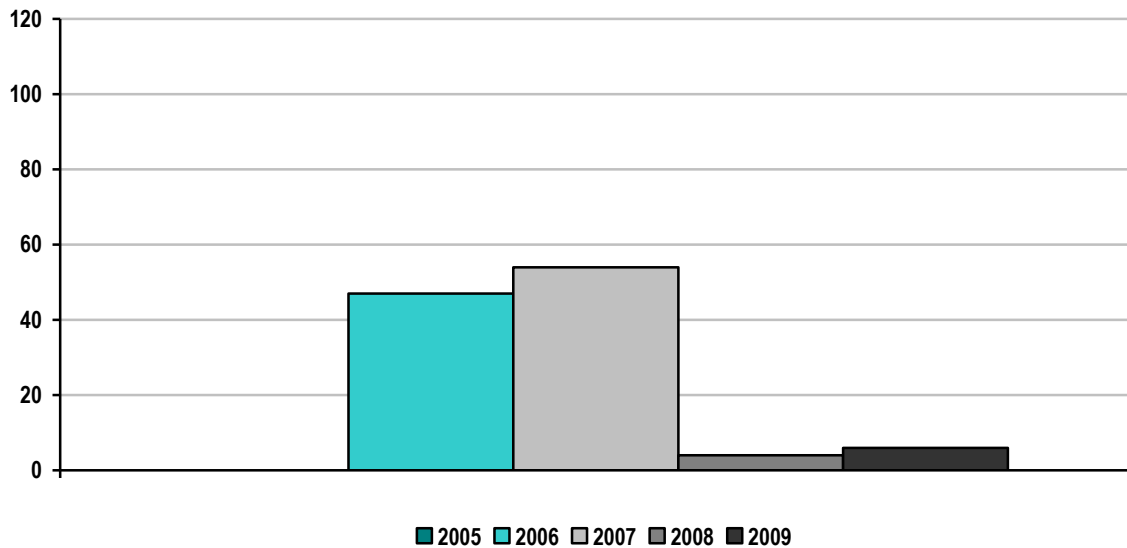
The California ISO has forecasted for wind since 2007 and improved its wind forecast accuracy to deal with the increasing penetration of wind resources to meet California's renewables portfolio standard. The data reported here uses the mean absolute error percentage, which is a method that the ISO believes softens the true error in forecasting by smoothing out the positive and negative deviation spikes that may occur during power production. The ISO is now using the root mean square error method to evaluate performance, a method it believes is superior as it does not allow for positive and negative forecast from different intervals to cancel each other out and so does not mask deviation magnitudes over a large sample.



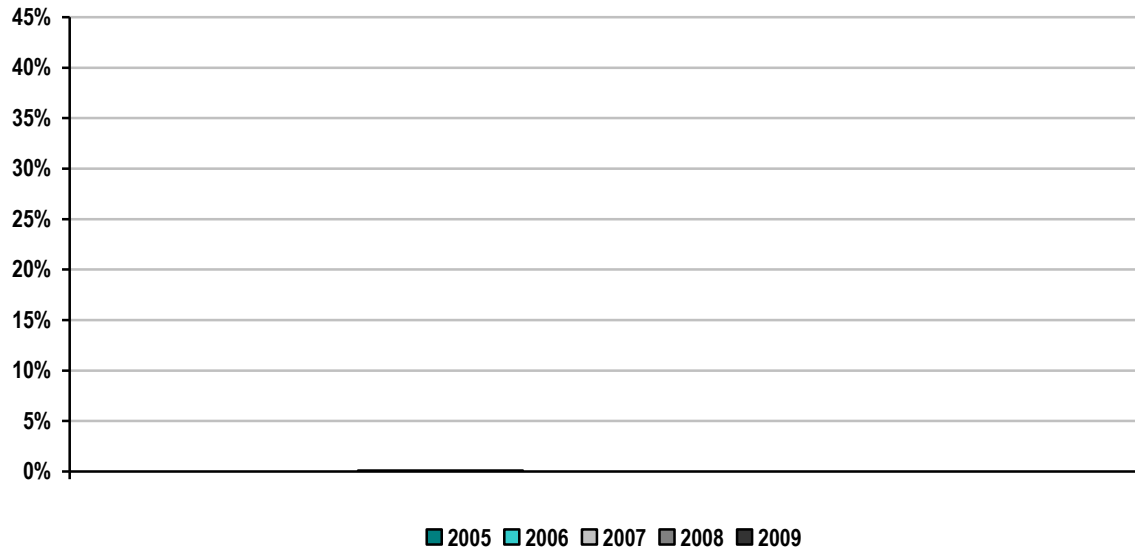
Unscheduled Flows

The Western Interconnection where the California ISO operates is a geographically large, circular 345/500 kV AC system that inherently has substantial loop flow attributable to the prevalence and reliance upon contract path historical transmission rights in 35 of its 37 balancing authority areas, as opposed to a power flow solution based dispatch methodology. The absolute value of unscheduled flow as a percentage of total flows is sufficiently insignificant such that it does not register on the second chart below.

California ISO Absolute Value of Total Unscheduled Flows 2006-2009
(terawatt hours)



California ISO Absolute Value of Unscheduled Flows
as a Percentage of Total Flows 2006-2009



The table below reflects terawatt hours of unscheduled flows for the top five California ISO interfaces. Positive amounts represent unscheduled flows out of the ISO and negative amounts represent unscheduled flows into ISO over the noted interface, which is the standard in the Western Interconnection.

California ISO Unscheduled Flows by Interface	<i>(terawatt hours)</i>				
	2005	2006	2007	2008	2009
Arizona Public Service Co.	(2)	(3)	(3)	(3)	(3)
Bonneville Power Administration	0	1	1	0	1
Los Angeles Department of Water and Power	(5)	(7)	(8)	(10)	(10)
Sacramento Municipal Utility District	0	(2)	(3)	(2)	(2)
Salt River Project	2	3	4	4	4

Transmission Outage Coordination

There are many variables involved in performing an outage study. Most studies can be performed in the time allowed for planned outage submission, but some outages and combinations of outages can result in more complex studies that require additional time to complete and validate. Therefore, not having 100% of the planned outages studied within established timeframes is not necessarily indicative of a failure to comply. In essence, this group of metrics looks at whether long duration outages are submitted well in advance so the California ISO may better plan for reliable and efficient operations during the outage.

ISO timeframes for approving outages changed with the introduction of the new market design in April 2009. Prior to that time, outages submitted three business days before start of outage needed to be studied one day before the start of the outage. Since that time, outages need to be studied prior to the day-ahead market. In addition, several of the metrics reference a specific voltage level for the outage that could not be systematically determined until an advanced grid topology tool was put in place concurrent with the new market. Accordingly, comparable data is not available for years 2005-2008, and only the period since April 2009 is reported here.

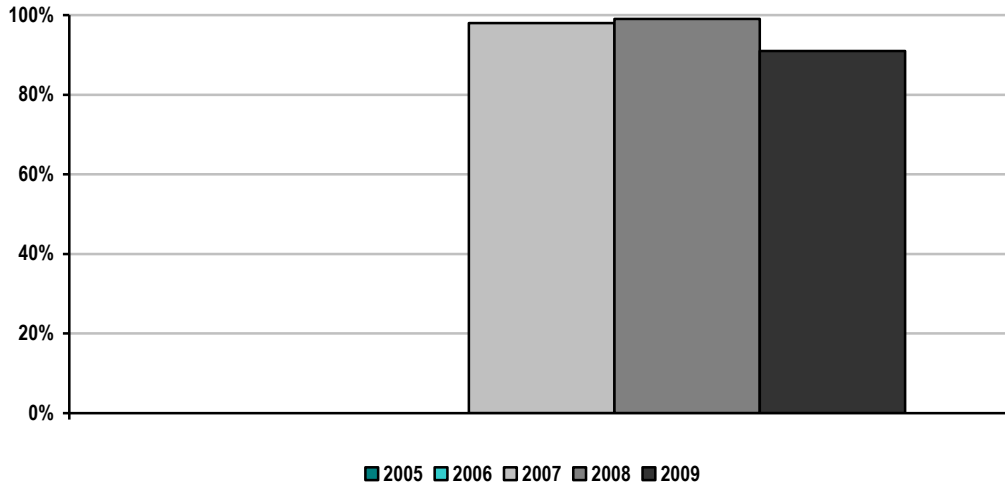
The first metric measures transmission owner performance, not ISO performance. In addition, such submissions allow time to potentially include these requirements in the transmission allocation processes as appropriate.

California ISO Percentage of > 200kV planned outages of 5 days or more that are submitted to ISO/RTO at least 1 month prior to the outage commencement date 2009



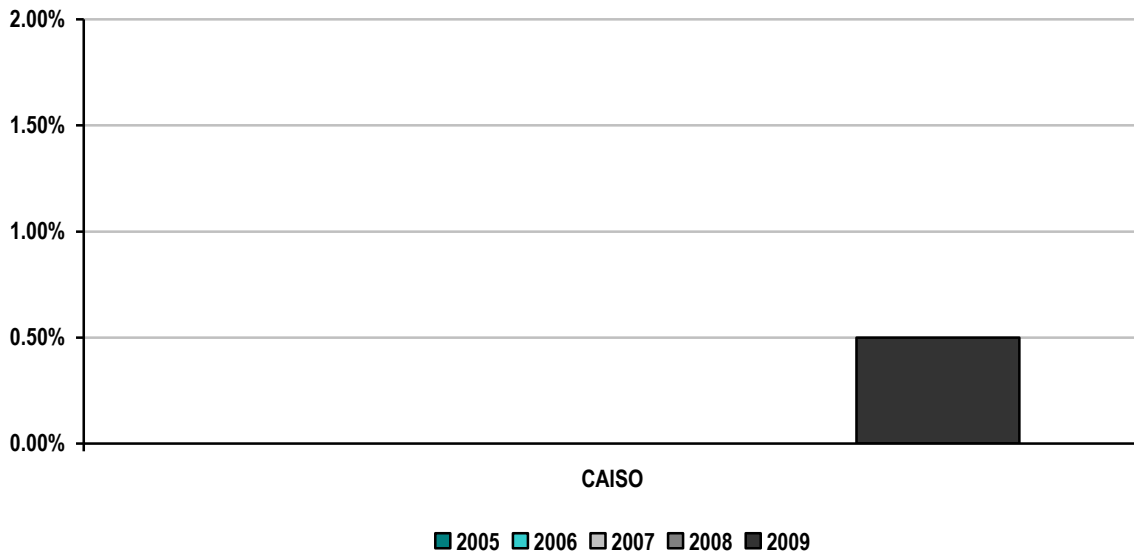
The second metric measures compliance with established timeframes; however, as discussed above, the study of a planned outage involves numerous factors and the failure to meet established timeframes in any specific instance should not be assumed to be caused by a shortcoming of the California ISO. For this metric, no voltage level is specified and the ISO was able to look back three years.

California ISO Percentage of planned outages studied in the respective ISO/RTO Tariff/Manual established timeframes 2007-2009



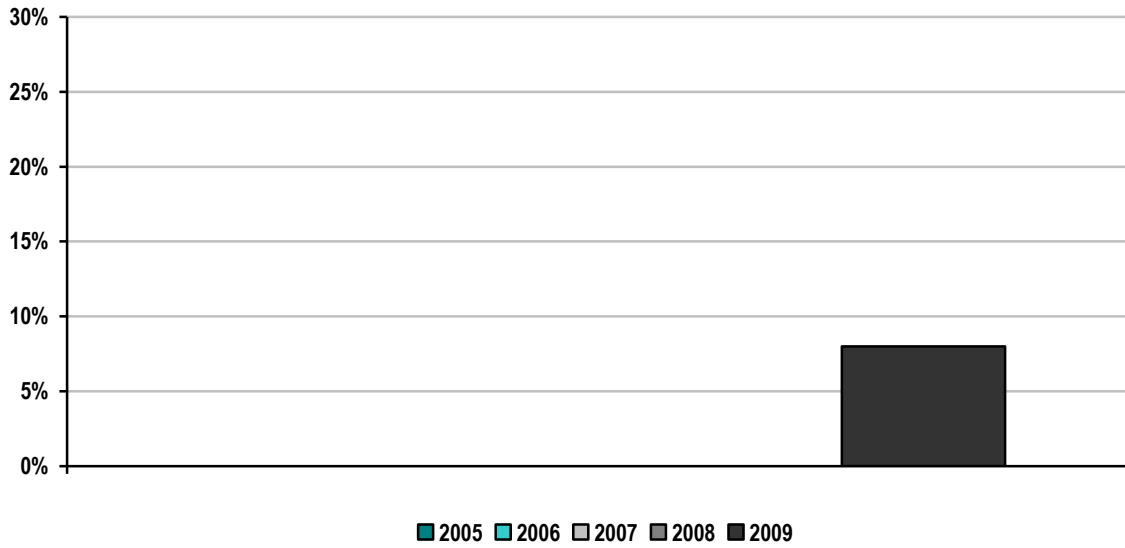
The third metric measures the frequency of cancellation of previously approved transmission outages. Such cancellations will generally occur only if there has been some system or unforeseen weather event in which an approved transmission outage would cause a reliability concern. It may also indicate whether approval of an outage was based on inaccurate or incomplete information. For example, when outages are approved in advance, a number of assumptions may be needed, which indicates the information available to fully assess the impacts of the outage is inadequate.

California ISO Percentage of > 200 kV outages cancelled by ISO/RTO after having been previously approved 2009



The fourth metric measures the frequency of unplanned outages. California ISO data only includes outages where start time is prior to reporting time, and therefore does not include imminent outages where reporting time is prior to start time, but still would be considered as an unplanned outage.

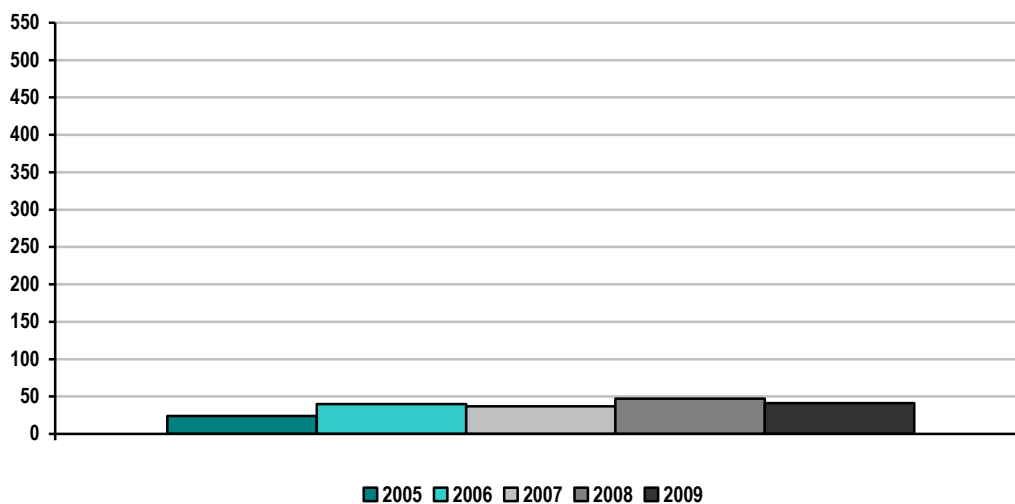
California ISO Percentage of unplanned > 200kV outages 2009



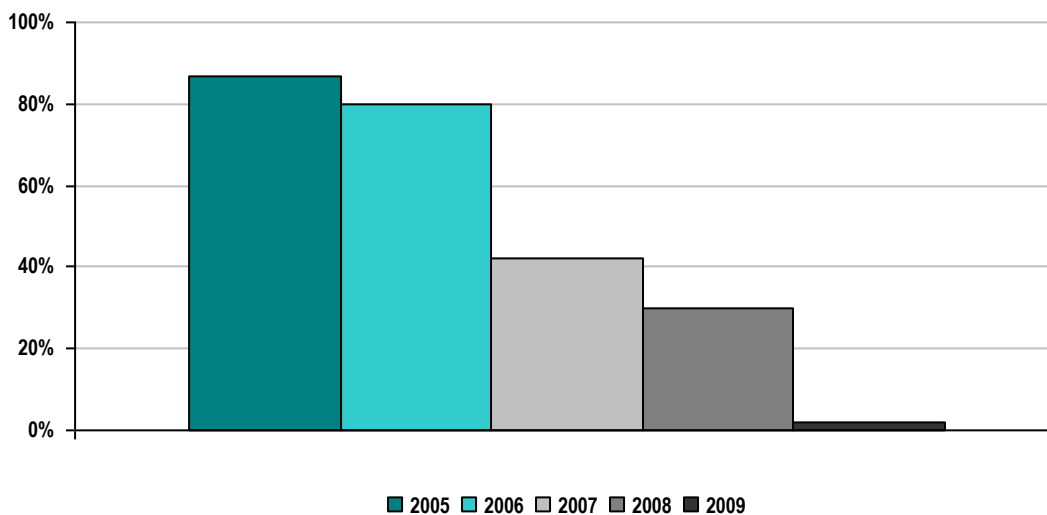
Transmission Planning

California ISO results are based on a compliant Order No. 890 process and adherence to NERC, WECC, and ISO planning standards. ISO transmission planning is an annual process that includes performing a variety of technical studies, such as short and long-term reliability assessments, economic planning assessments, and other key studies that are needed to support the markets and ensure a reliable and secure transmission infrastructure. Since implementing its Order No. 890 compliant process, the ISO has completed a reliability assessment in 2008 and a reliability and economic assessment in 2009. During 2010, the ISO developed and filed with the Commission significant reforms to modify its planning process to better address state mandated renewable integration requirements. Under these proposed reforms, which are still pending Commission approval, the ISO will continue to perform reliability and economic assessments as has been done in previous plans.

California ISO Number of Transmission Projects Approved to be Constructed for Reliability Purposes
2005-2009

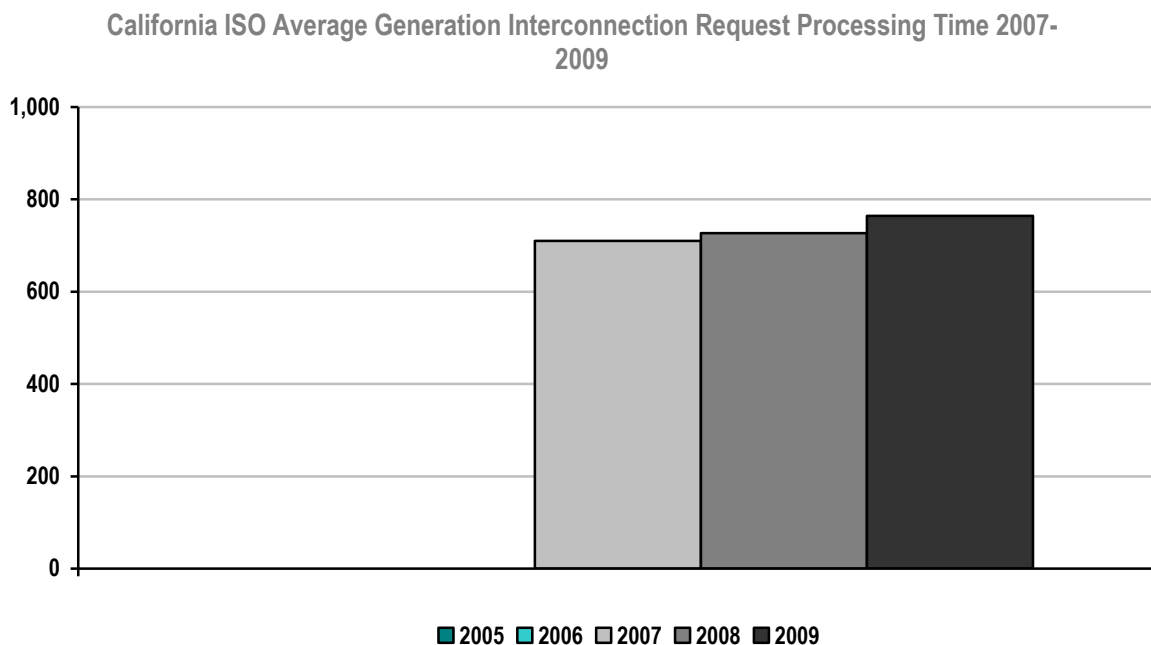


California ISO Percentage of Approved Construction Projects Completed by December 31, 2009



Generation Interconnection

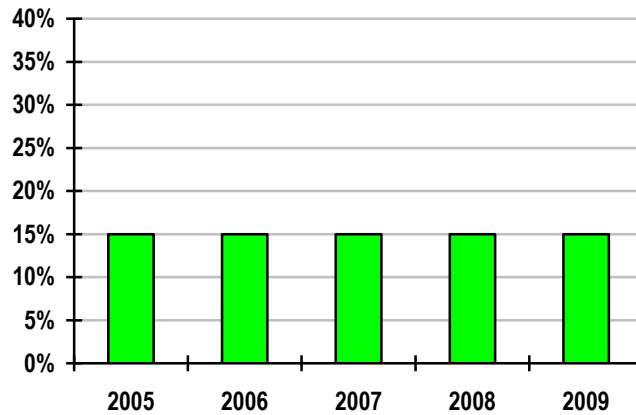
In 2008, the California ISO replaced its large generation interconnection serial study process with a more efficient group study or clustering approach for interconnection requests. By using a cluster study approach, the ISO and participating transmission owners have been better able to more quickly evaluate the large volume of interconnection requests. The process includes two cluster windows each year for submitting interconnection requests and a two-phased interconnection study process. The first group to go through the process (the transition cluster) just completed the Phase II Study process, and the ISO anticipates the benefits of these and other process improvements to be reflected in 2011.



Reserve Margin

The California ISO 15% planning reserve margin is based on the California Public Utilities Commission's resource adequacy program. That requires load-serving entities to demonstrate they have acquired the capacity needed to serve the 1-in-2 forecast of retail customer load plus a 15-17% reserve margin. It also incorporates the California Public Utilities Commission approved monthly demand response amounts as capacity resources. Measuring compliance with the California Public Utilities Commission resource adequacy requirement is not an ISO function and, therefore, the ISO is not in a position to report the actual reserve percentage procured.

California ISO Planned Reserve Margin 2005 – 2009

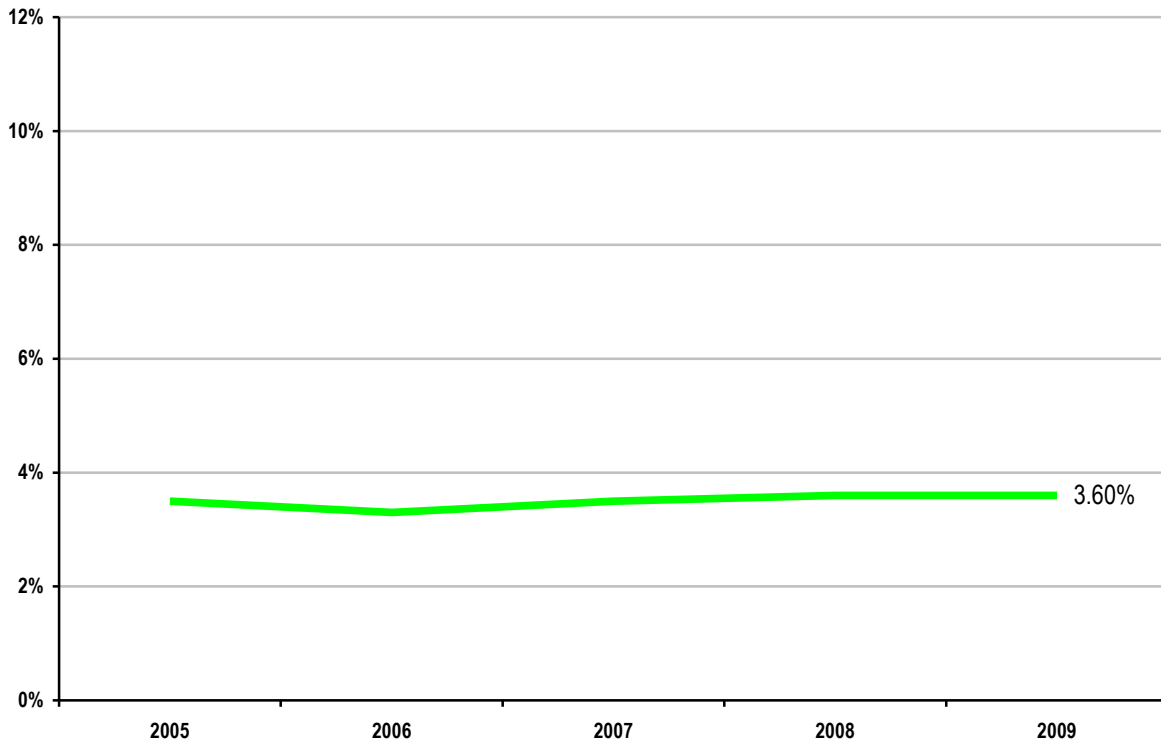


Bars Represent Planned Reserve Margins

Demand Response Capacity

The California ISO uses the California Public Utilities Commission methodology for determining the resources that count as demand response capacity, and the amount expected from such programs when called upon.

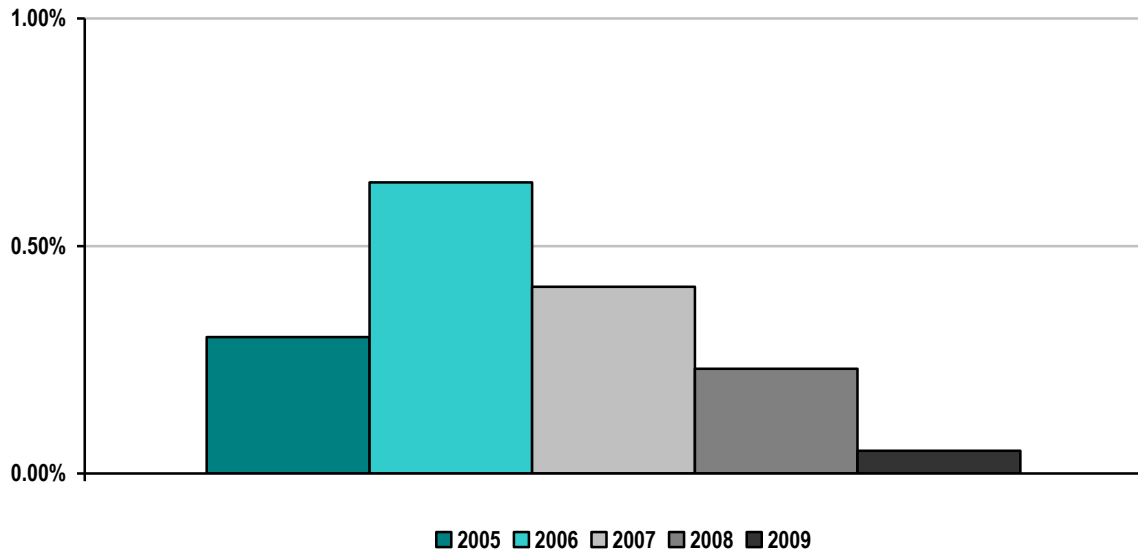
California ISO Demand Response Capacity as Percentage of Total Installed Capacity 2005-2009



Percentage of Generation Outages Cancelled by ISO/RTO

In 2009 the percentage of generation outages cancelled by the California ISO was 0.05%. There has been a downward trend over the prior four years.

Percentage of Generation Outages Cancelled by California ISO

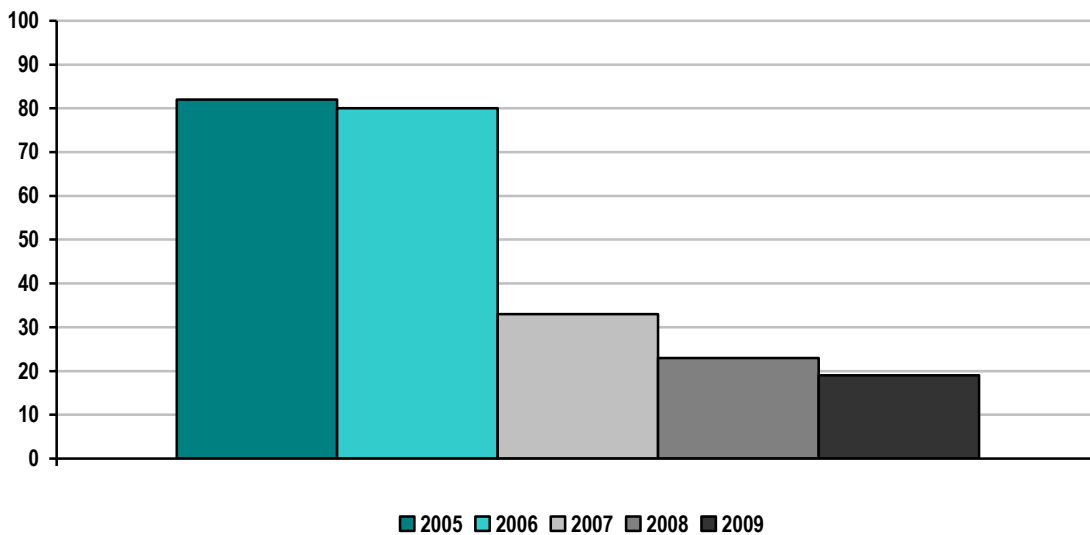


Generation Reliability Must Run Contracts

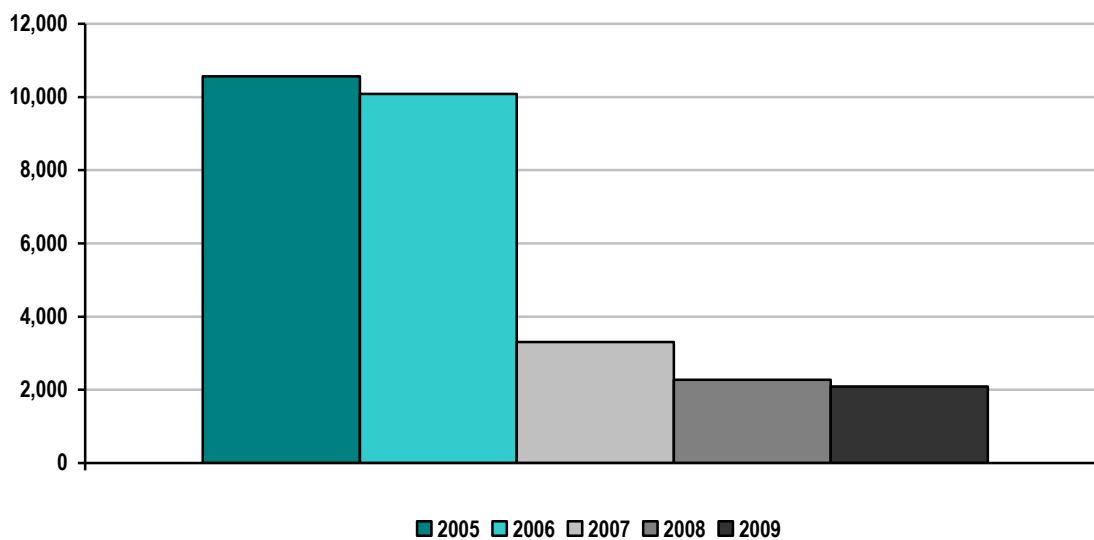
The capacity under reliability must run (RMR) contract was greatly reduced in 2007 when resource adequacy provisions established by the California Public Utilities Commission became effective and contracting under the resource adequacy program provided an alternative to RMR contracting. Capacity procured under resource adequacy now provides the California ISO with much of the local capacity needed for reliability purposes. The amount of RMR capacity continues to decline as existing RMR units are retired after being replaced with new units or electrical system improvements.

These changes have allowed the California ISO to further reduce costs by releasing a significant amount of generation under must-run contracts without undermining local reliability. In 2009, must-run costs decreased 41 percent from 2008 to \$39.1 million. That is down from just over \$120 million in 2007 and \$254 million in 2005.

California ISO Number of Generating Units under RMR Contracts



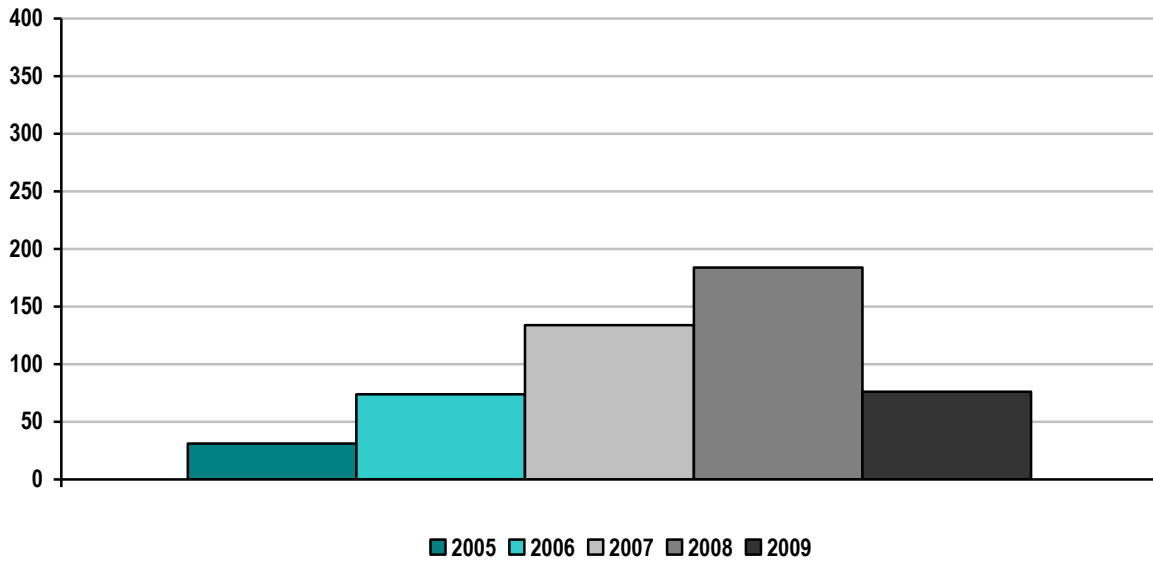
California ISO Capacity (MW) under RMR Contracts



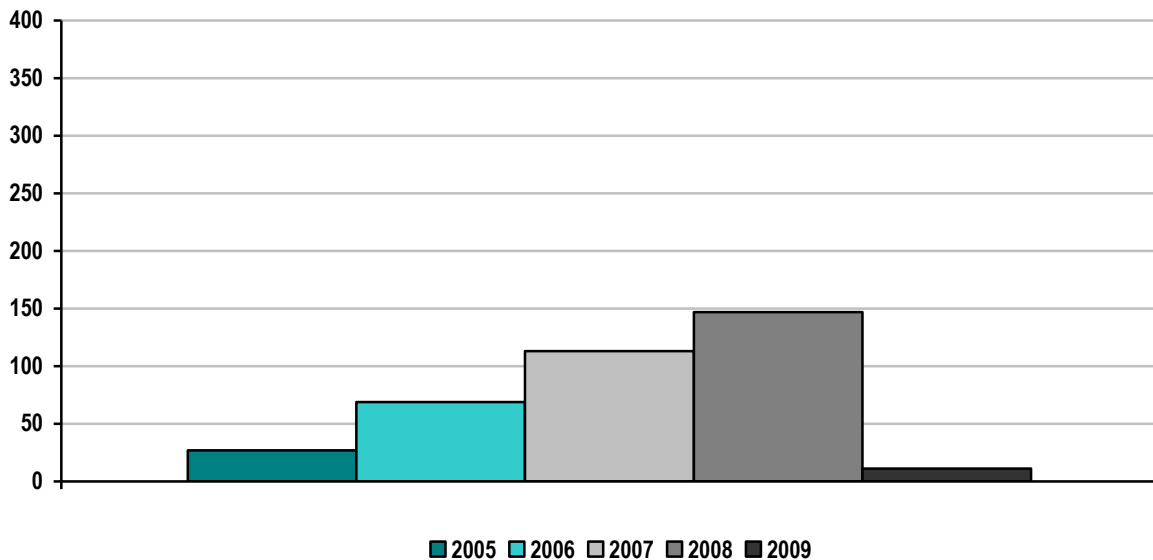
Interconnection / Transmission Service Requests

The California ISO recently completed the transition cluster process as part of a reform effort that began in 2008. The California ISO continues to improve its interconnection process and in 2011 anticipates to have meaningful comparable measures of its interconnection process improvement efforts. The following tables reflect the number of studies requested and how many were completed, as well as the average aging of studies and the time required to complete the generator interconnection process

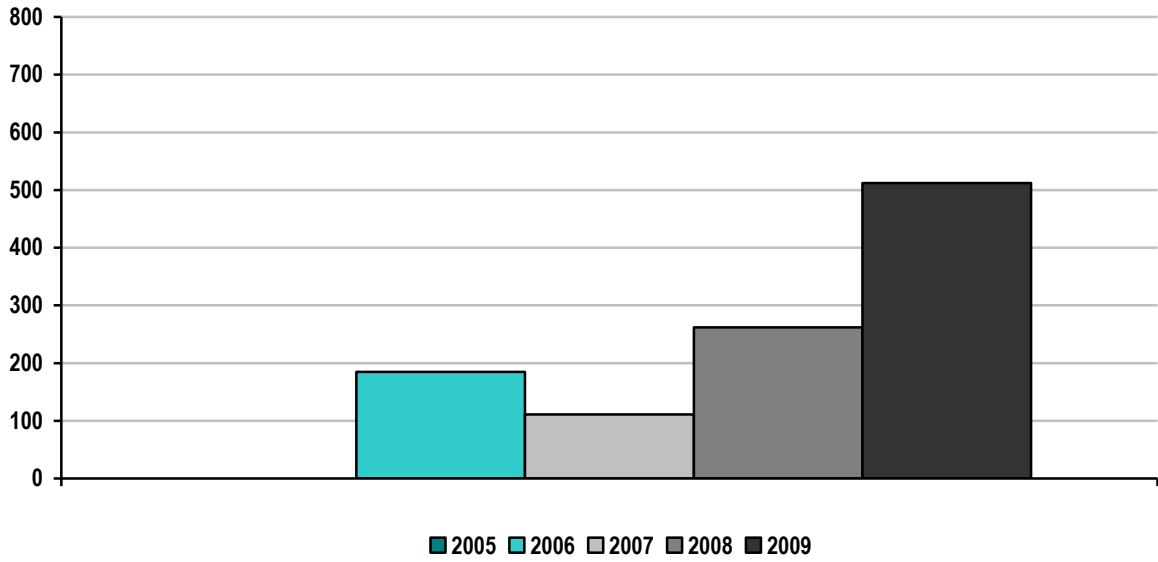
California ISO Number of Study Requests 2005-2009



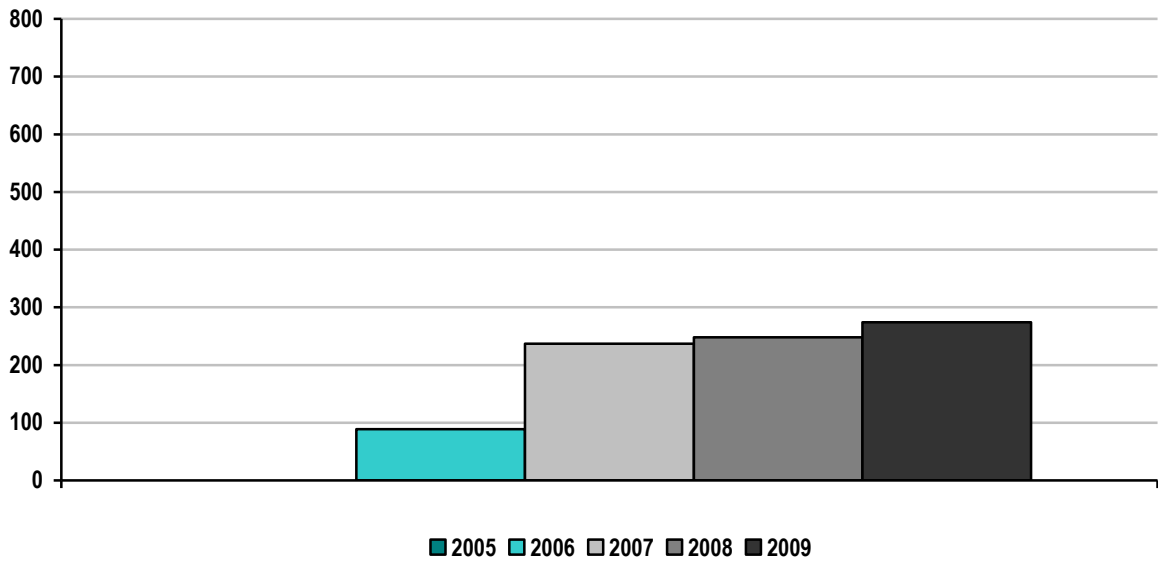
California ISO Number of Studies Completed 2005-2009



California ISO Average Aging of Incomplete Studies 2006-2009



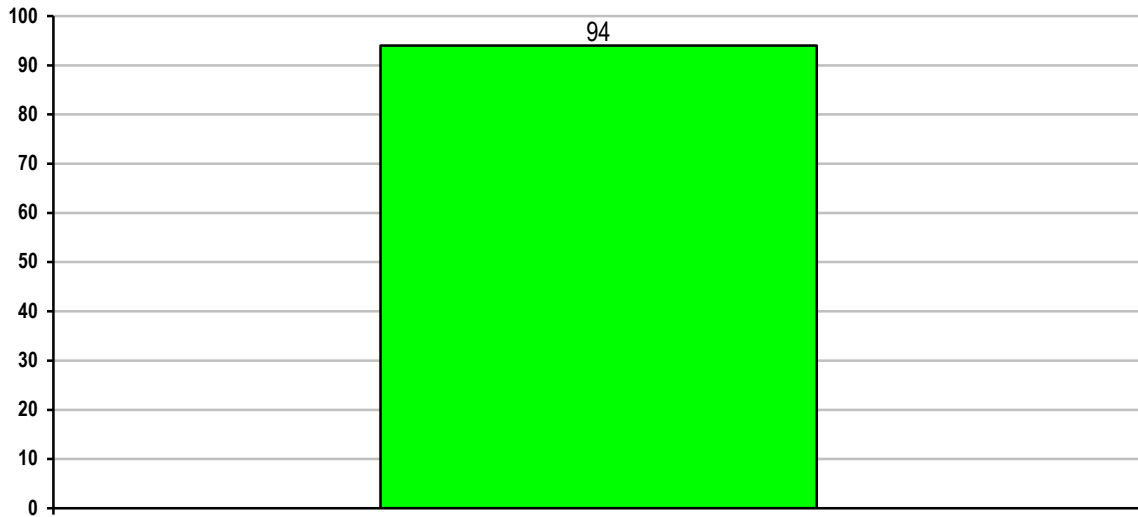
California ISO Average Time to Complete Studies 2006-2009



Special Protection Schemes

Two special protection schemes were activated intentionally and one was activated unintentionally during 2009. All three activated special protection schemes responded as designed.

California ISO Number of Special Protection Schemes 2009



B. California ISO Integrated Wholesale Power Markets

Market Competitiveness

California ISO's market design relies upon a high level of self-supply and forward-contracting by load-serving entities as a means of mitigating system-level market power. This is consistent with California Public Utilities Commission policies designed to ensure that the state's major utilities are hedged for a large portion of their energy supply needs. The potential for market power on a system level basis is addressed by an energy bid cap, which will increase in the second and third years of the new market design. During 2009, an absolute ceiling cap on overall market prices was also in effect. This market price cap is eliminated starting in April 2010.

Ownership of generation resources within most transmission constrained load pockets of the system is highly concentrated under one or two major suppliers. Therefore, the new market design includes more stringent provisions for mitigation of local market power. These local market power mitigation provisions are similar to the approach employed by PJM. Under this approach, units that must be dispatched to provide additional incremental energy to relieve transmission constraints deemed to be non-competitive may have their market bids lowered based on a default energy bid, which reflects the unit's actual marginal operating costs.

California ISO Price Cost Markup

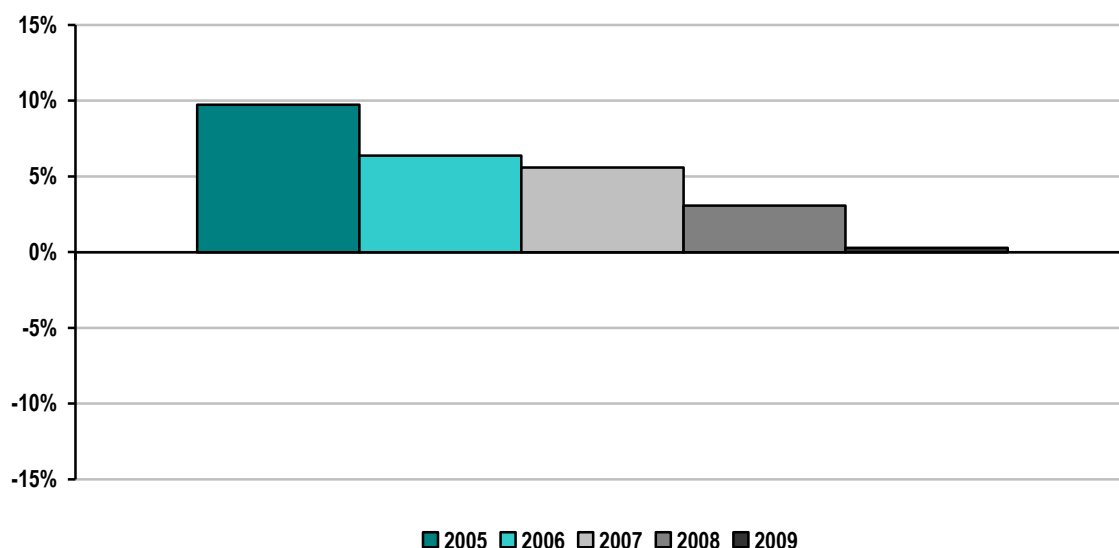
The California ISO estimates the price-cost mark-up for its wholesale market by comparing total estimated wholesale energy costs to cost that would result under competitive baseline prices. The ISO estimated these competitive baseline prices by re-simulating market outcomes after replacing market bids for gas-fired generation with bids reflective of the unit actual marginal costs.

The table below summarizes the results for the period 2005-2009. California ISO's wholesale markets have been competitive during this period with a price-cost mark-up generally ranging from 5 to 10 percent, with a clear downward trend.

The price-cost markup and other analysis indicate that prices under the new market design implemented in 2009 are extremely competitive. However, direct comparisons with the price-cost markups reported in previous years are difficult due to the different way in which price-cost markup is calculated under the new market. Specifically, since there was no formal forward energy market in previous years, market costs were estimated based on a variety of different bi-lateral price indices and cost estimates. With the new market design, these costs can be directly estimated by on prices in the ISO's day-ahead and real-time energy markets. The method used to calculate the competitive baseline price under the ISO's new market design is also modified and is based on a more detailed re-simulation of the market compared to the method used in prior years.

The extremely low price-cost mark-up calculated under the new methodology and market design may also reflect increased efficiencies of this new market design, rather than increased competitiveness. On a going-forward basis, this new competitive baseline methodology will provide a more accurate tool for assessing changes in market competitiveness or efficiency over time.

California ISO Price-Cost Mark-up: 2005-2009

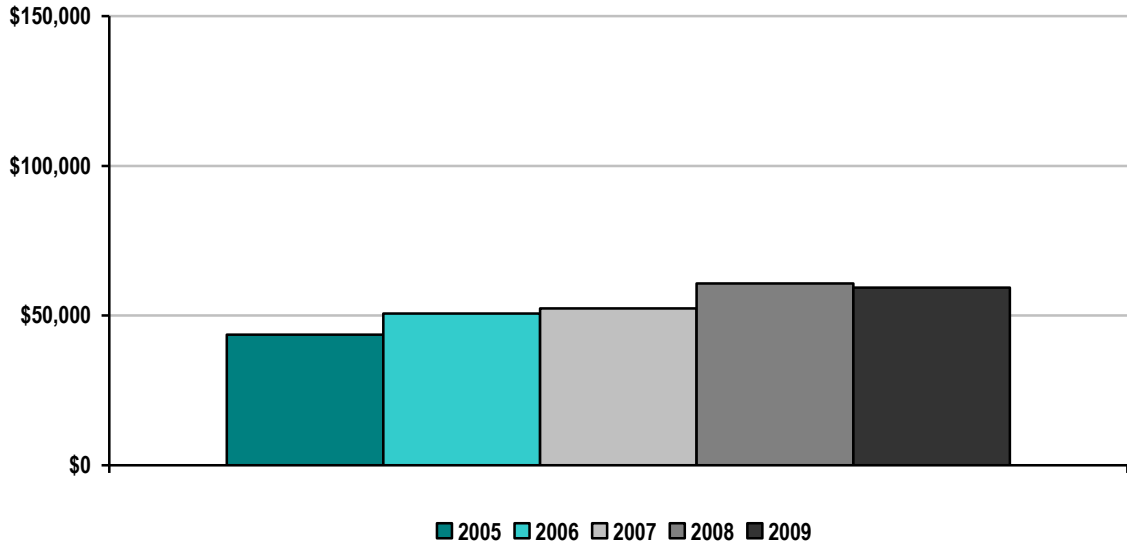


California ISO Generator Net Revenues

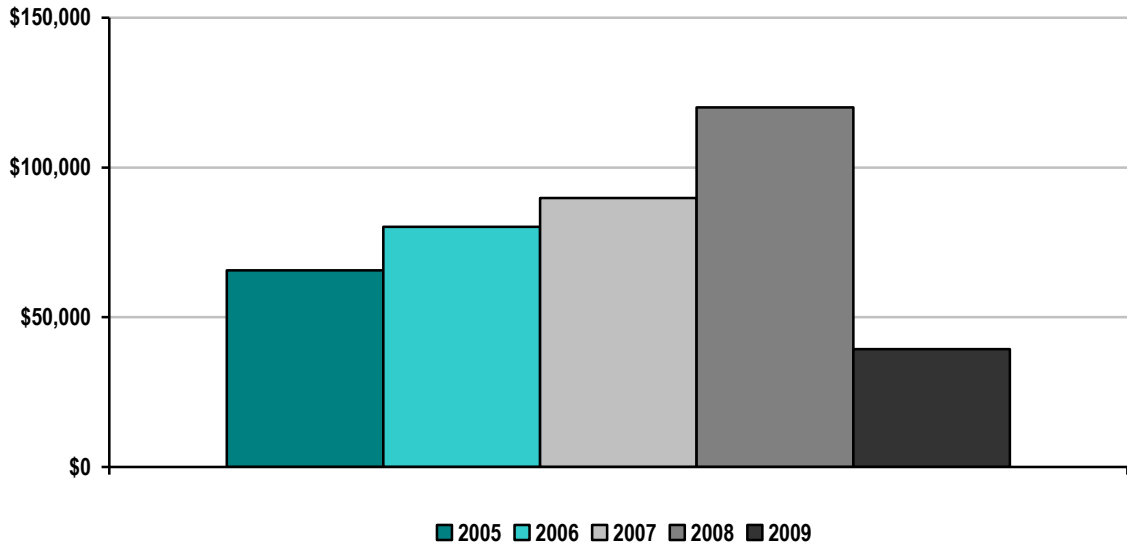
Results for a typical new combined cycle and combustion turbine unit are shown below. The significant increase in new generation costs in 2009 can be largely attributed to increases in capital and financing costs, and taxes. These cost estimates are based on surveys and third-party research reflecting a more current sampling of costs incurred by builders and investors in new generation compared than data from the California Energy Commission's (CEC) 2007 *Integrated Energy Policy Report* used in this analysis in prior years.

The 2009 results for a typical new combined cycle unit show a substantial decrease in net revenues compared to 2008 net revenues. The 2009 net revenue estimates for a hypothetical combined cycle unit fall substantially below the \$191/kW-yr annualized fixed cost estimated provided by the CEC. The decrease in net revenues can largely be attributed to the decrease in spot market gas market prices and the resulting decrease in electric prices. It may seem counterintuitive that lower gas prices would decrease net revenues for a new gas resource. However, since older less efficient gas units are often the marginal resources setting prices in the market, lower gas prices decrease the net revenues of new more efficient generation that are infra-marginal by a larger percentage than the decrease in spot market gas prices.

California ISO New Entrant Gas-Fired Combustion Turbine (CT) Net Generation Revenues 2005-2009
(dollars per installed megawatt year)



California ISO New Entrant Gas-Fired Combined Cycle (CC) Net Generation Revenues 2005-2009
(dollars per installed megawatt year)



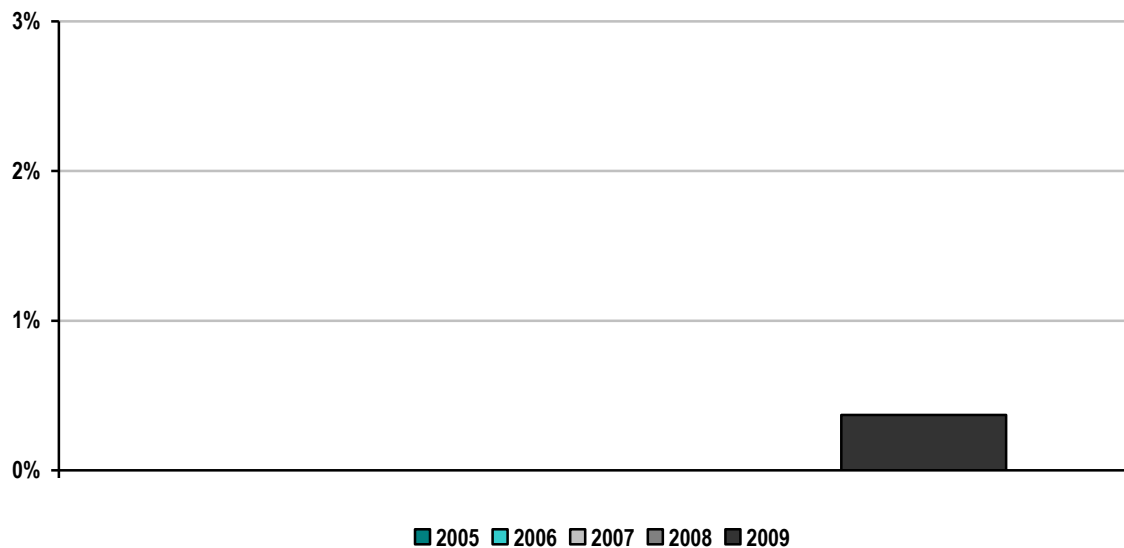
California ISO Mitigation

Mitigation of a unit's market bids is triggered only when a unit is actually required to operate or run at a higher level due to network constraints previously deemed non-competitive. If a unit is subject to bid mitigation, the unit's original market bids are compared to its default energy bid and may be adjusted downwards, if necessary, so that the unit's bid curve does not exceed its default energy bid. The unit's resulting mitigated bid curve is used in the final energy market run.

During each month in 2009, an average of only 1 to 3 units per hour were subject to mitigation in the day-ahead market. About 80 percent of units subject to mitigation actually had market bids lowered as a result of mitigation. This reflects that, in a significant portion of cases, a unit's market bid is below its default energy bid or the unit's highest priced bid clearing the competitive constraints run is higher than its default energy bid. In such cases, no modification of the unit's market bid occurs.

Only about 30 percent of units subject to mitigation may have been dispatched at a higher level in the day-ahead market as a result of bid mitigation. This reflects that the degree to which a unit's market bid curve is reduced by mitigation is often relatively small, and would not impact the level at which the unit is ultimately dispatched in the day-ahead market.

California ISO Real-Time Energy Market Percentage of Unit Hour Bids Mitigated due to Mitigation 2009⁽¹⁾

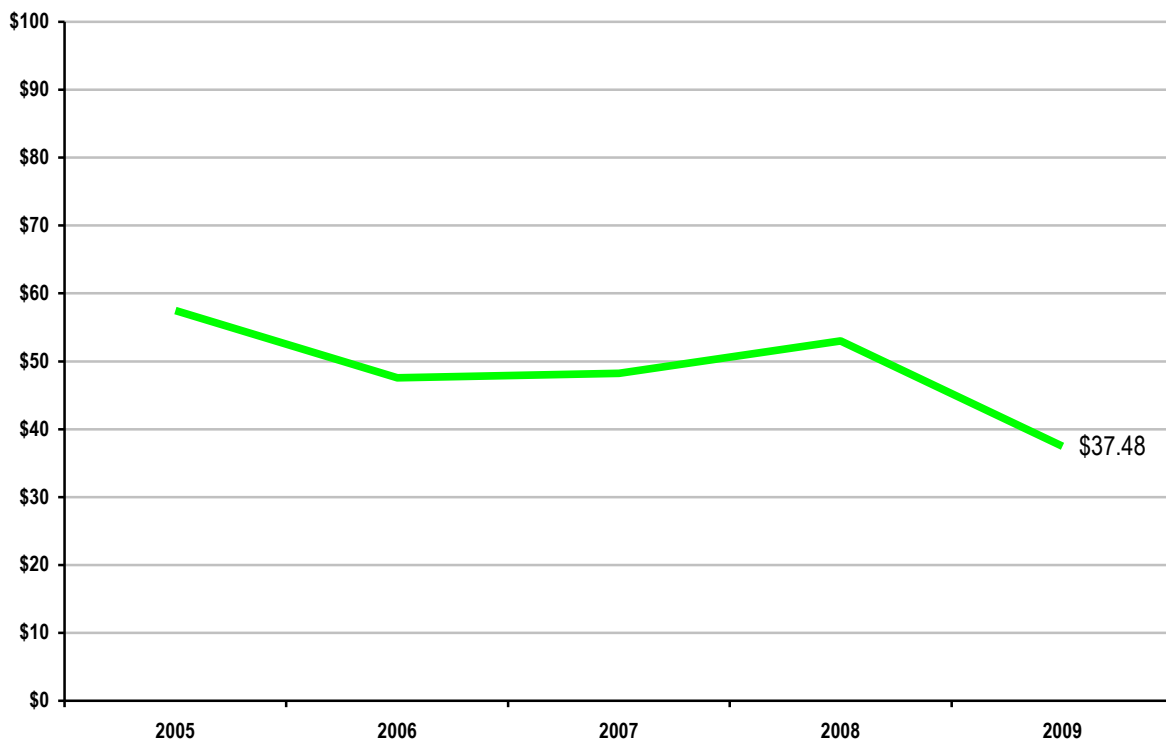


(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

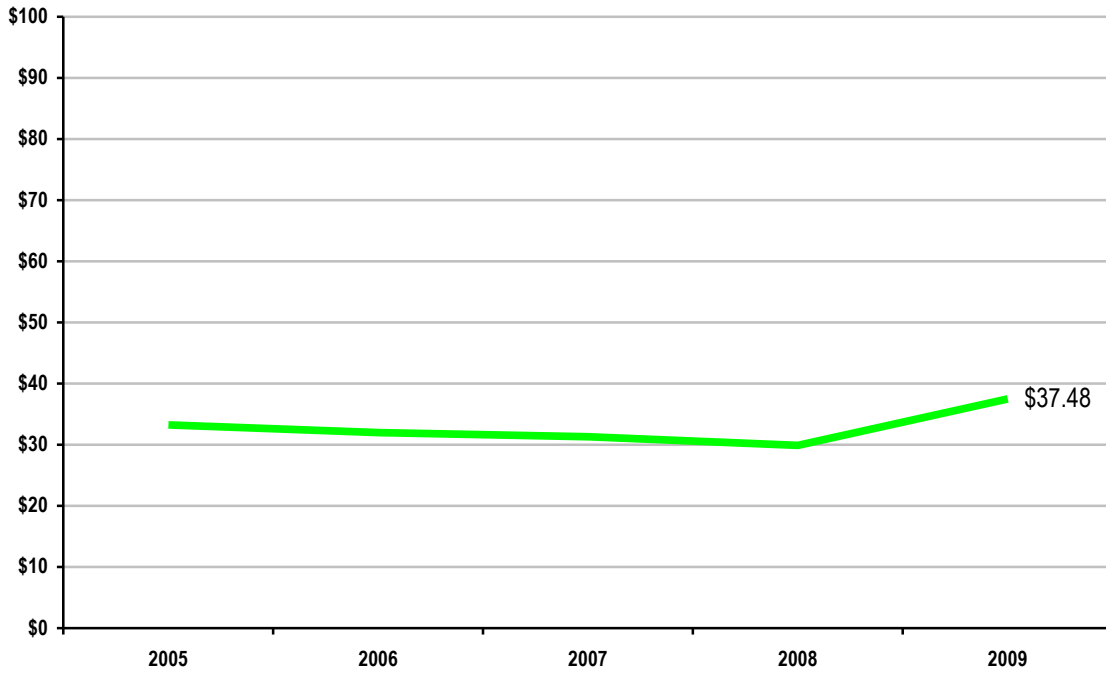
Market Pricing

The California ISO markets implemented in April 2009 introduced a new day-ahead market and redesigned real-time market. The overall performance of the new day-ahead and real-time markets were highly efficient with energy prices following patterns of well-functioning competitive markets, reflecting production costs, and trending generally with the price of natural gas, the most prevalent fuel for marginal resources on the system. The ISO includes wholesale energy pricing information for reference to prior years, understanding the market structure changed completely with the implementation of the new markets. Other metrics in this section are reported as of the start of the new market.

California ISO Average Annual Load-Weighted Wholesale Energy Prices 2005-2009
(\$/megawatt-hour)

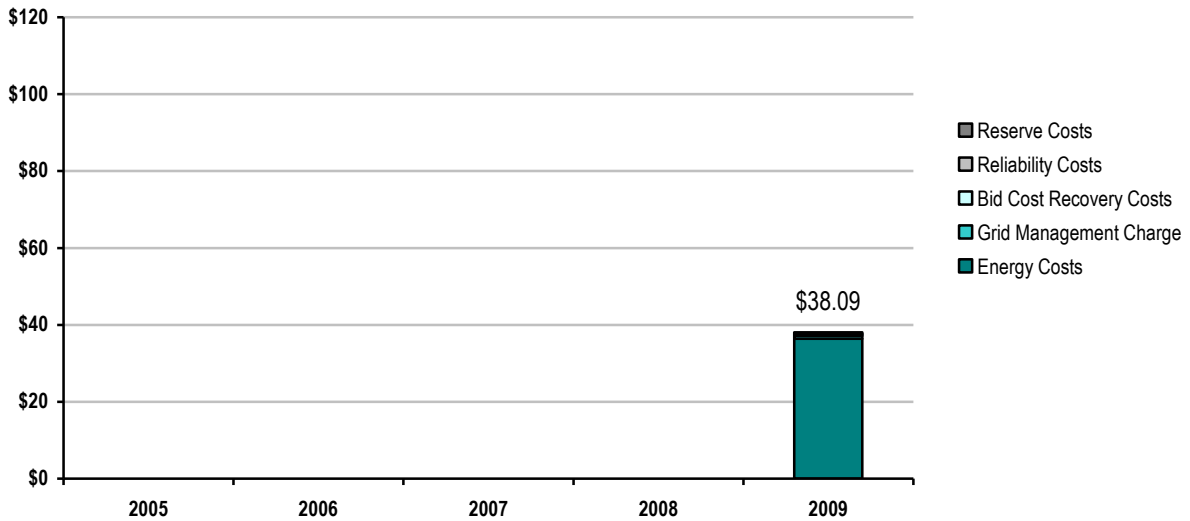


**California ISO Average Annual Load-Weighted
Fuel-Adjusted Wholesale Spot Energy Prices 2005-2009 ⁽¹⁾**
(\$/megawatt-hour)



(1) California ISO base for fuel costs references 2009 gas prices.

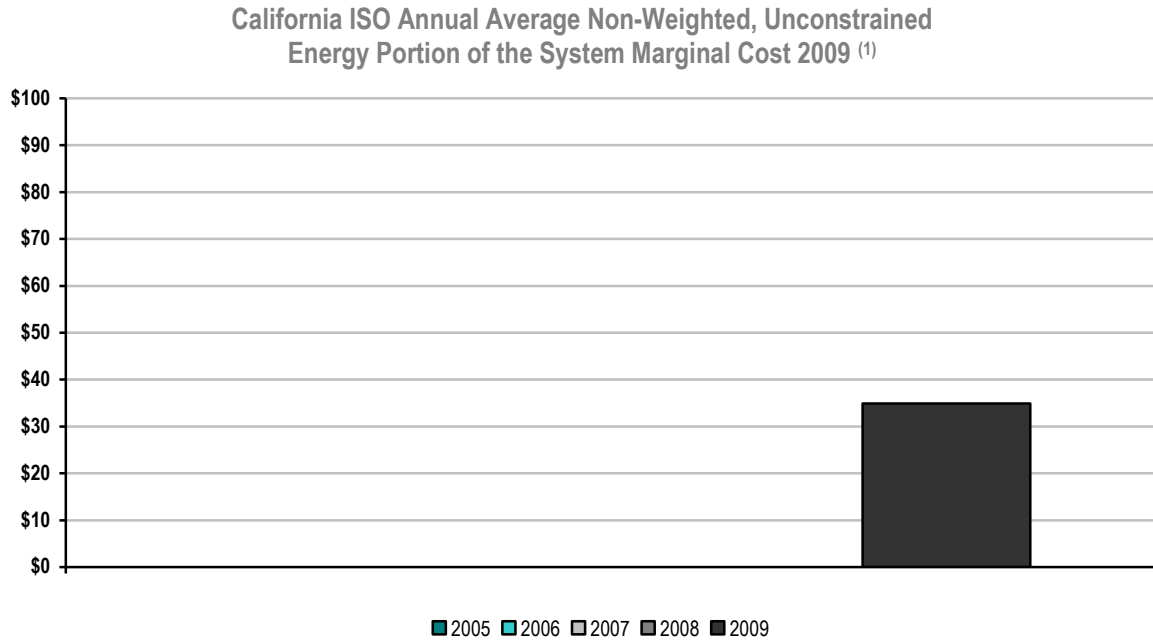
California ISO 2009 Wholesale Power Cost Breakdown ⁽¹⁾
(\$/megawatt hour)



(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Unconstrained Energy Portion of System Marginal Cost

The average, non-weighted, unconstrained energy portion of the system marginal cost measures the marginal energy price in dollars per megawatt hour exclusive of transmission constraints and transmission losses.

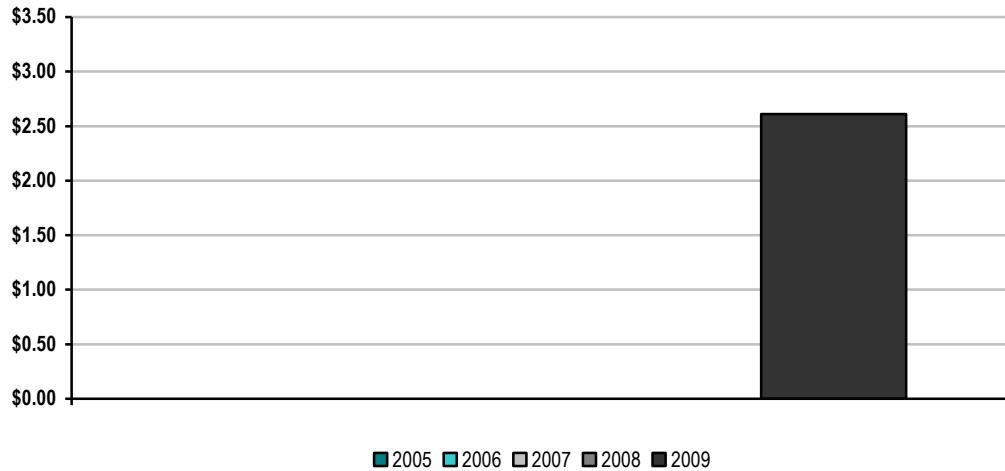


(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Energy Market Price Convergence

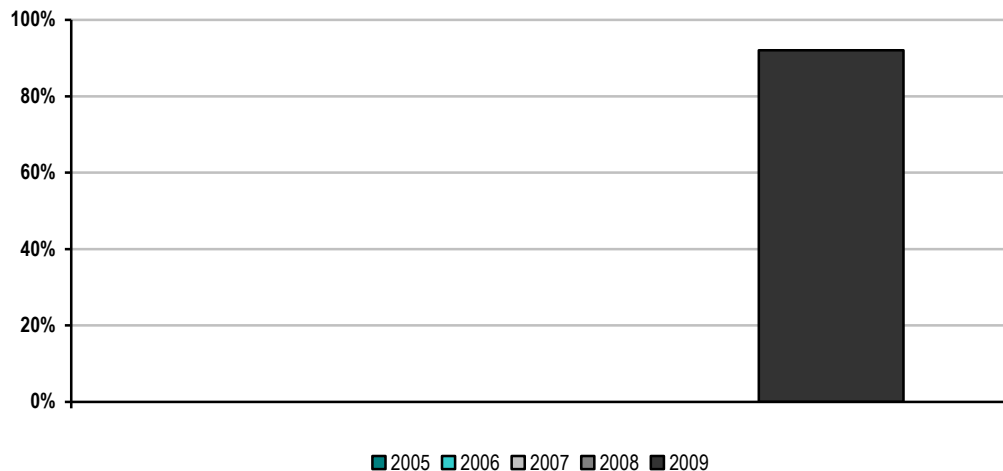
Price convergence in 2009 under the California ISO's new market exceeded 92% and subsequent periods may very well see this number rise. For example, excluding just the first month of market operations pushes the price convergence for 2009 up to 98% and excluding the first two months increases the real-time and day-ahead price convergence to 99.95%.

California ISO Day-Ahead and Real-Time Energy Market Price Convergence 2009 ⁽¹⁾



(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

California ISO Percentage of Day-Ahead and Real-Time Energy Market Price Convergence 2009 ⁽¹⁾

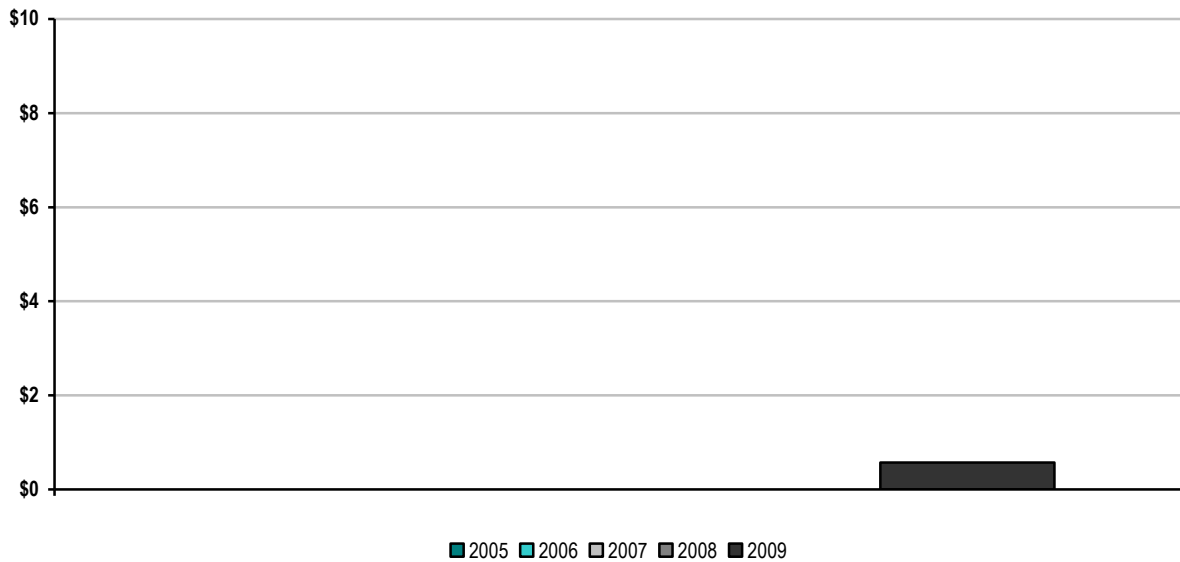


(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Congestion Management

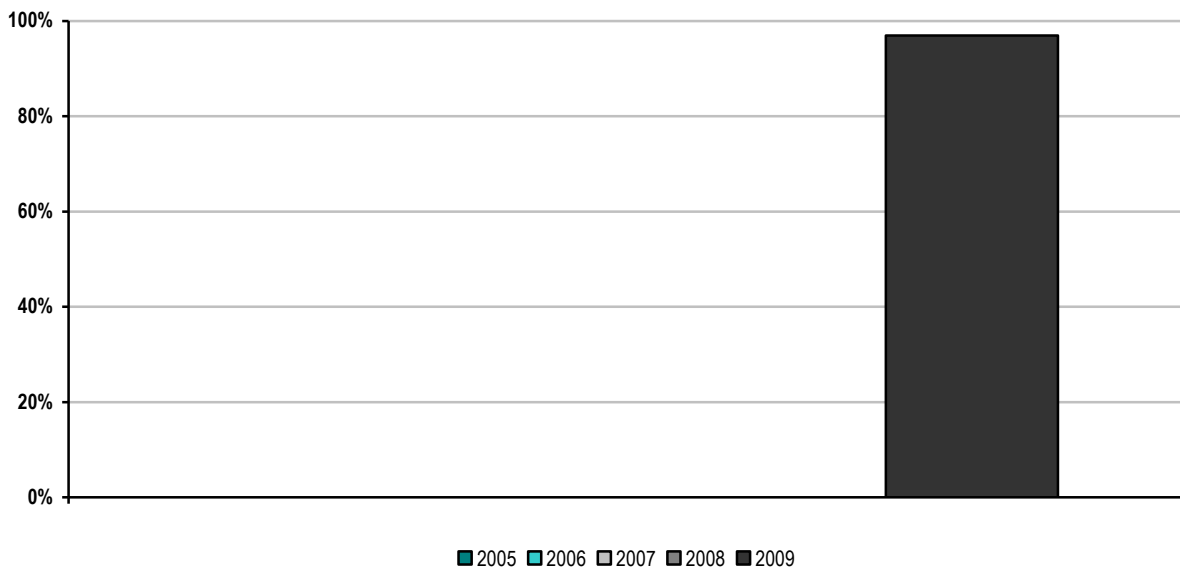
Under the new market structure, market participants can acquire congestion revenue rights through a California ISO allocation and auction process to hedge the cost of congestion on the system. The objective of the first metric is to quantify the hourly average congestion cost per megawatt of load served. The objective of the second metric is to quantify the congestion cost hedged with congestion revenue rights.

California ISO Annual Congestion Costs per Megawatt Hour of Load Served 2009 ⁽¹⁾



(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Percentage of Congestion Dollars Hedged Through California ISO Congestion Management Markets 2009⁽¹⁾

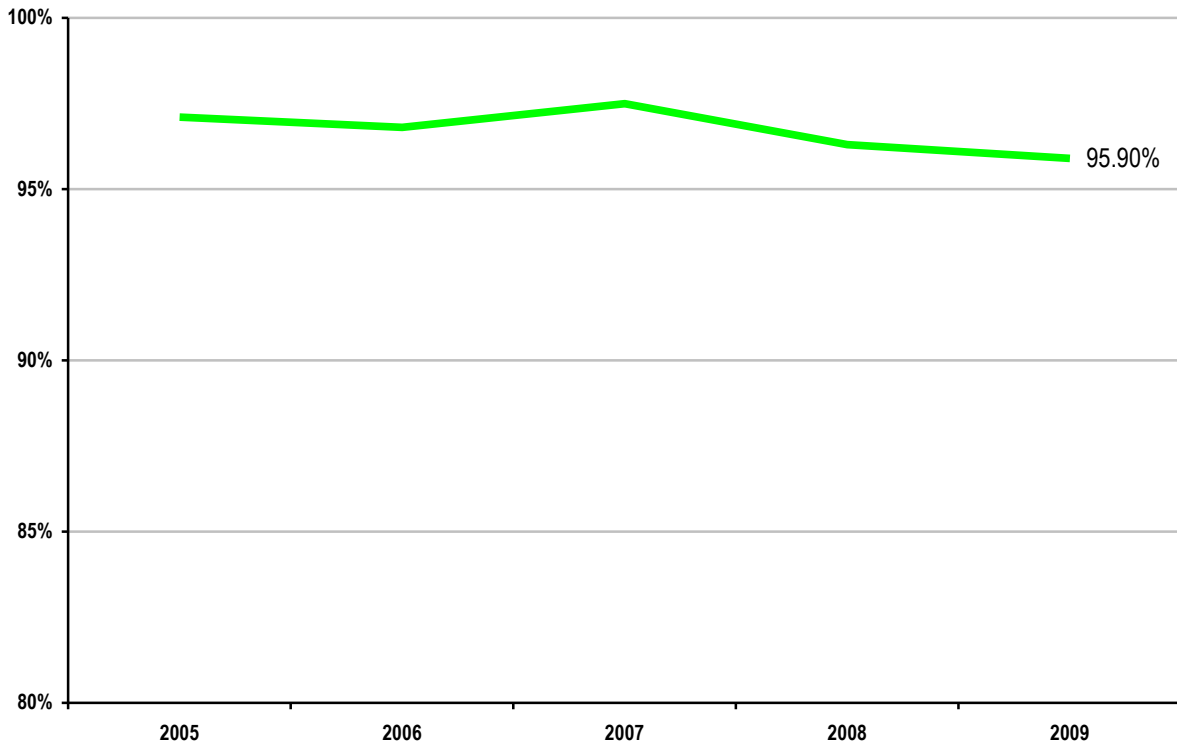


(1) California ISO data represents the period April 1, 2009 through December 31, 2009.

Generator Availability

The California ISO average annual generator availability calculation is the total generation MW unavailable due to forced outages for the year compared to the maximum generation capacity within the ISO.

California ISO Annual Generator Availability 2005 – 2009

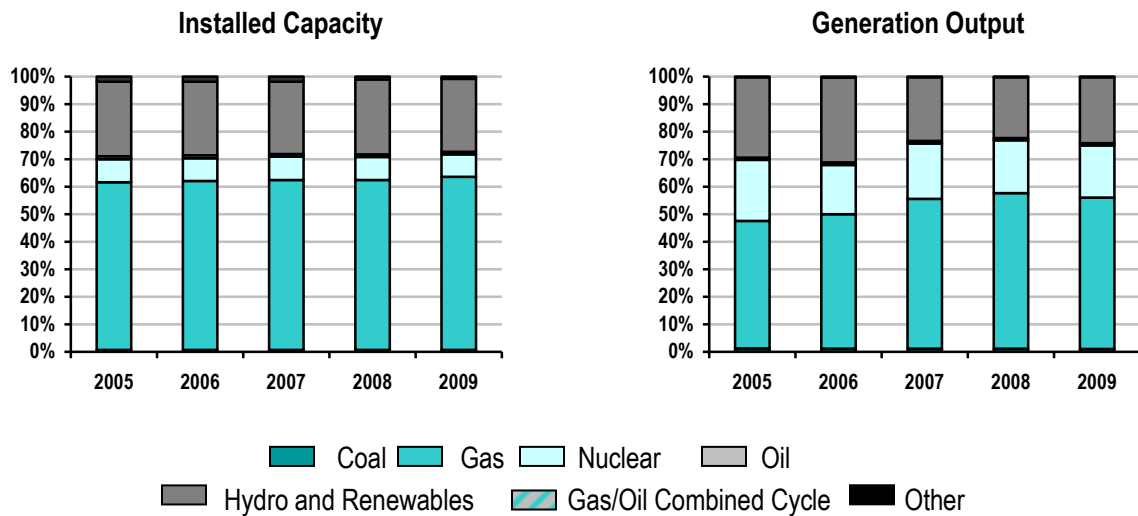


Fuel Diversity

The generation in the California ISO balancing authority area is made up of natural gas, hydro, renewables, nuclear, oil and coal. Natural gas generation, the predominant fuel source, covered 60.1% to 62.9% of the installed capacity in the ISO system from 2005 to 2009. Generation running on hydro and renewables was the second largest fuel source, 26.5% to 27.2%. Nuclear resource followed with 8.1% to 8.4%. Oil resource at 1% and other resources from 0.8% to 1.9% made up the remainder.

On the other hand, gas generation outputs varied from 46.5% to 56.5% from 2005 to 2009. Hydro and renewable outputs ranged from 22.4% to 30.8%. Nuclear generation outputs covered 17.8% to 21.8%. Coal generation outputs kept 1.1% to 1.3% and the other resources stayed 0.2% to 0.3%.

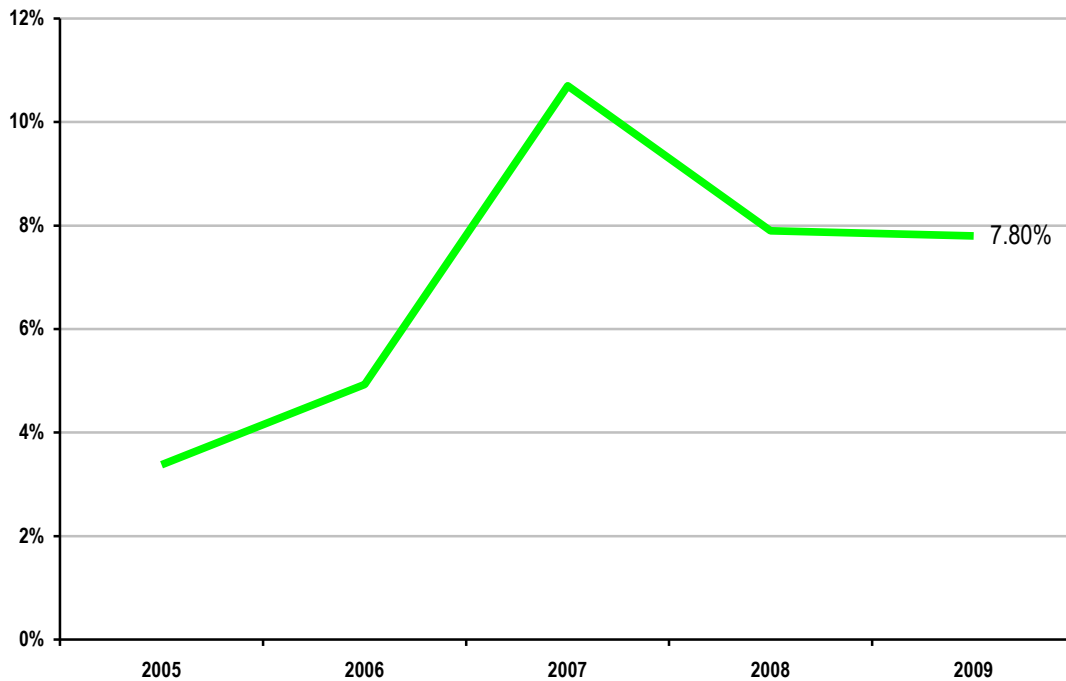
California ISO Fuel Diversity 2005-2009



Demand Response Participation in Synchronized Reserve Markets

The California ISO uses the California Public Utilities Commission methodology for determining the resources that count as demand response, and the amount expected from such programs when called upon. Demand response as a percentage of ancillary services reflects non-spinning reserve through either accepted bids or self provision. Demand response participation in other ancillary services markets is currently limited in the Western Interconnection by WECC rules, which the ISO is intends to address as part of a multi-year ancillary services redesign initiative and through its demand response initiatives such as the proxy demand resource product..

California ISO Demand Response as a Percentage of Synchronized Reserve Market 2005-2009

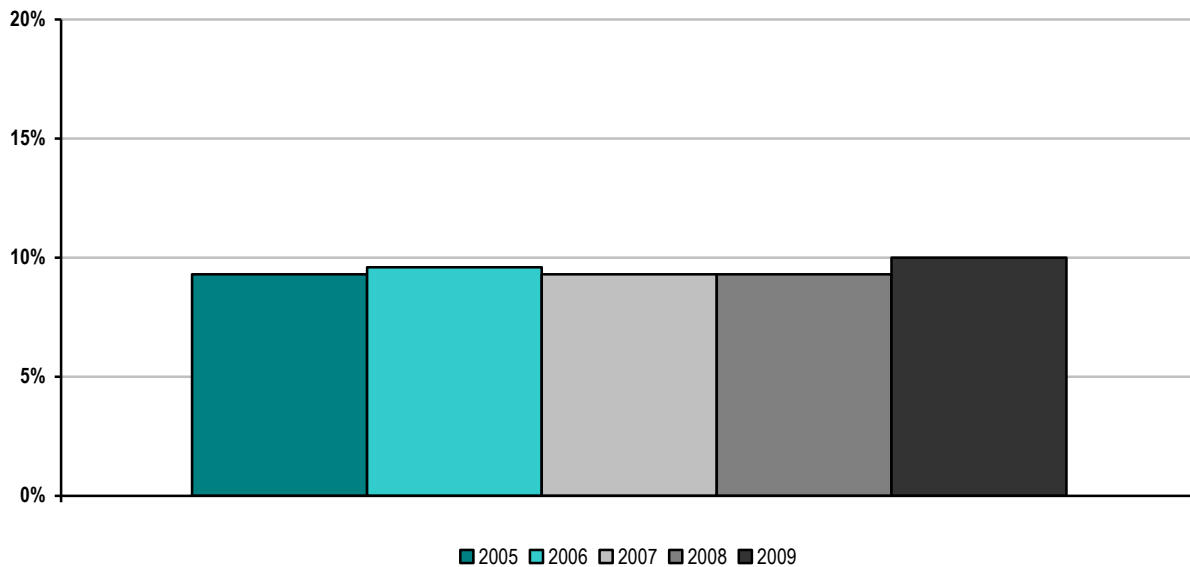


Renewable Resources

The California ISO uses the California Public Utilities Commission methodology for determining the renewables portfolio standard (RPS)* components of renewable resources, such as wind, solar, geothermal, biomass, biogas and small hydroelectric generating units. However, the figures reported here do not include renewable resources external to the ISO balancing authority area, internal renewable resources not connected to the ISO controlled grid, or the renewable resources to which the ISO does not otherwise have telemetry even though some of these resources ultimately may count towards the renewable portfolio standard. The renewable capacities as a percentage of the total capacity in the ISO system was 11.0% to 11.7% from 2005 to 2009 while the energy ranged was 9.3% to 10.0%.

The ISO is committed to working with state policy directives to achieve 20% RPS by 2010,² one of the most ambitious renewable energy standards in the country. The RPS requires electric corporations to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually. It was established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107. A gubernatorial executive order was signed on September 15, 2009 directing the California Air Resources Board to adopt regulations increasing the RPS to 33% by 2020.

California ISO Renewable Megawatt Hours as a Percentage of Total Energy 2005-2009

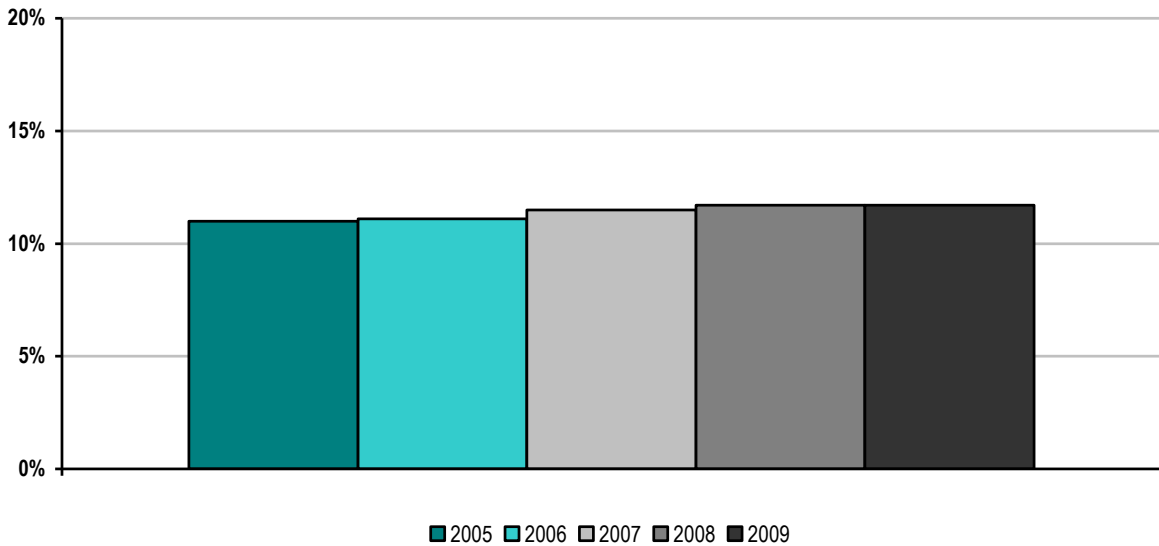


**Large hydro generations are not counted in the renewables portfolio standard.*

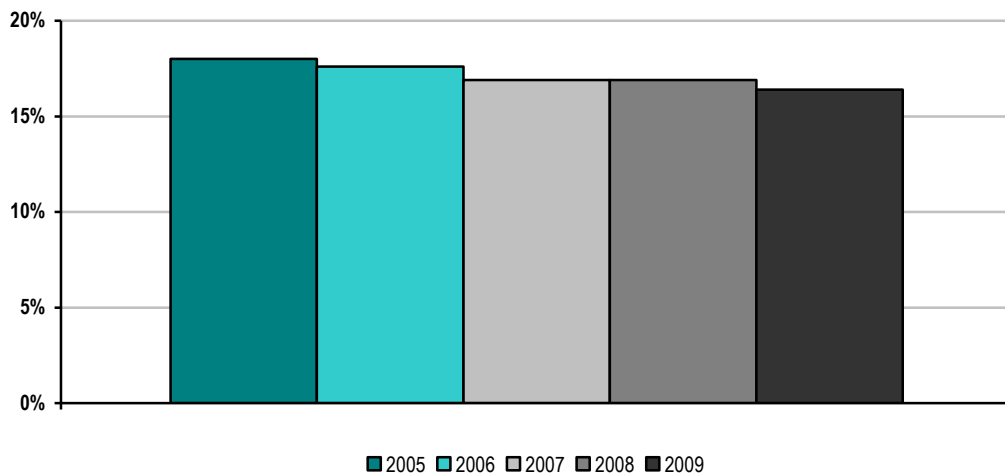
² In late 2009, the California Public Utilities Commission noted that the 2010 deadline would not be met and that 2013-2014 was more realistic. However, in mid-2010, based on declines in electricity consumption, rapid growth in RPS contract approvals (including short-term contracts for out-of-state wind energy), and other factors, the Commission estimated that the 20 percent target could be reached in 2011. In 2009, the California investor-owned utilities served 15.4 percent of their load with renewable energy eligible under the RPS.

The renewable and hydroelectric capacity data on the next two charts is based on generator nameplate capacity, which is the maximum rated output of a generator under conditions designated by the manufacturer.

California ISO Renewable Megawatts as a Percentage of Total Capacity 2005-2009

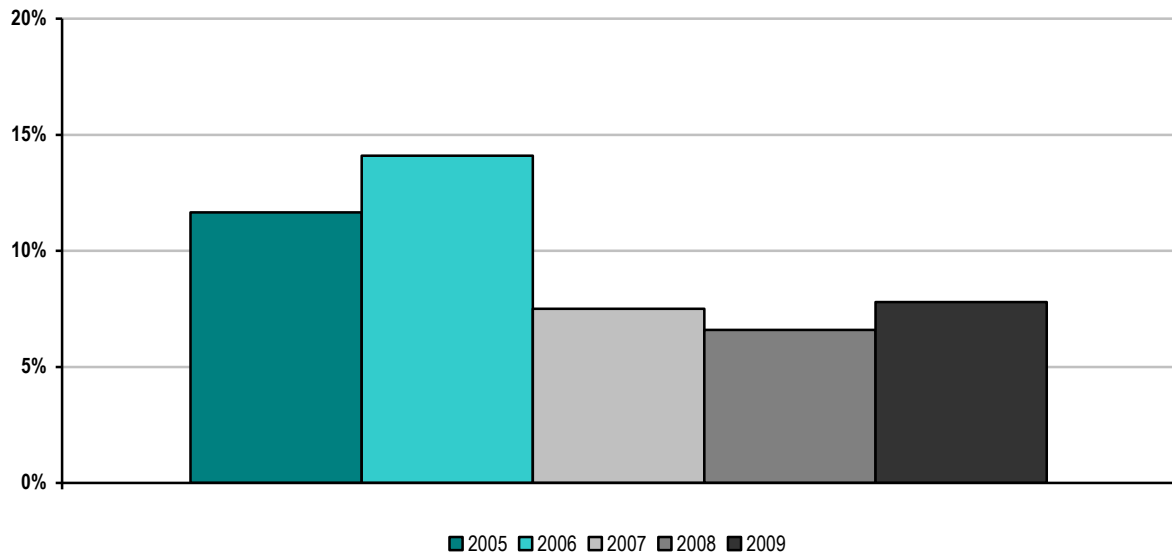


California ISO Hydroelectric Megawatts as a Percentage of Total Capacity 2005-2009



Data on total energy from hydroelectric power (including small resources, large resources, and pumped storage) is included in the chart below. The large hydroelectric capacities as a percentage amount of total capacity stayed 15.0% to 16.6% from 2005 to 2009 while large hydroelectric energies as a percentage amount of total energy varied from 6.6% to 14.1%.

California ISO Hydroelectric Megawatt Hours as a Percentage of Total Energy 2005-2009

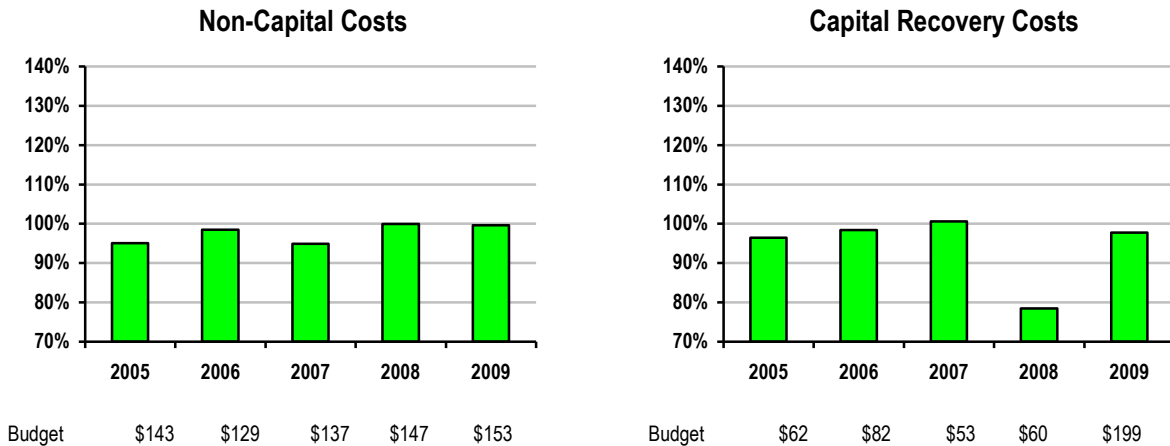


C. California ISO Organizational Effectiveness

Administrative Costs

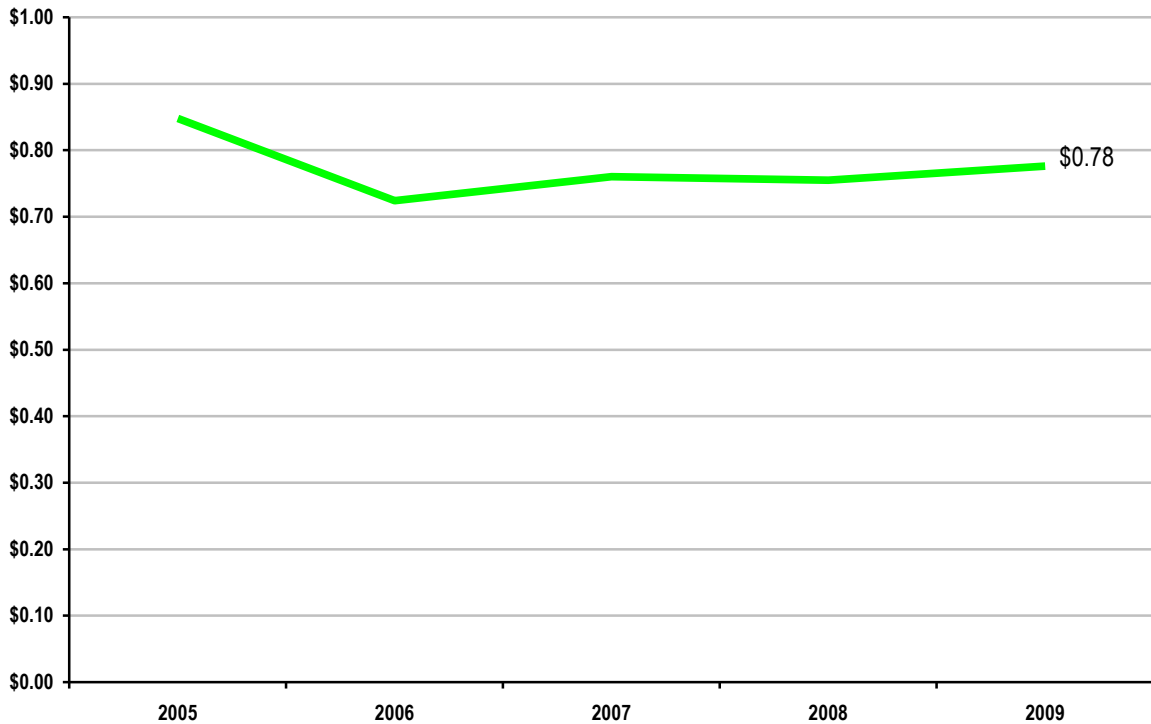
The California ISO did not have any material variances between its approved budgets and its actual costs from 2005 through 2009. The administrative charge is made up of almost 15 separate billing components, with weather, customer activity and other factors affecting the revenue billed and collected. If collections exceed costs, it is subtracted from the next year's ISO revenue requirement. Additionally the administrative charge can be adjusted quarterly up or down to reduce or increase over collections or under collections. The administrative costs per megawatt hour of load served should be reviewed in the context of the widely varying levels of annual load served by each ISO/RTO, about 249 terawatts for the ISO.

California ISO Annual Actual Costs as a Percentage of Budgeted Costs 2005-2009



Bars Represent % of Actual Costs to Approved Budgets; Dollar Amounts Represent Approved Budgets (in millions)

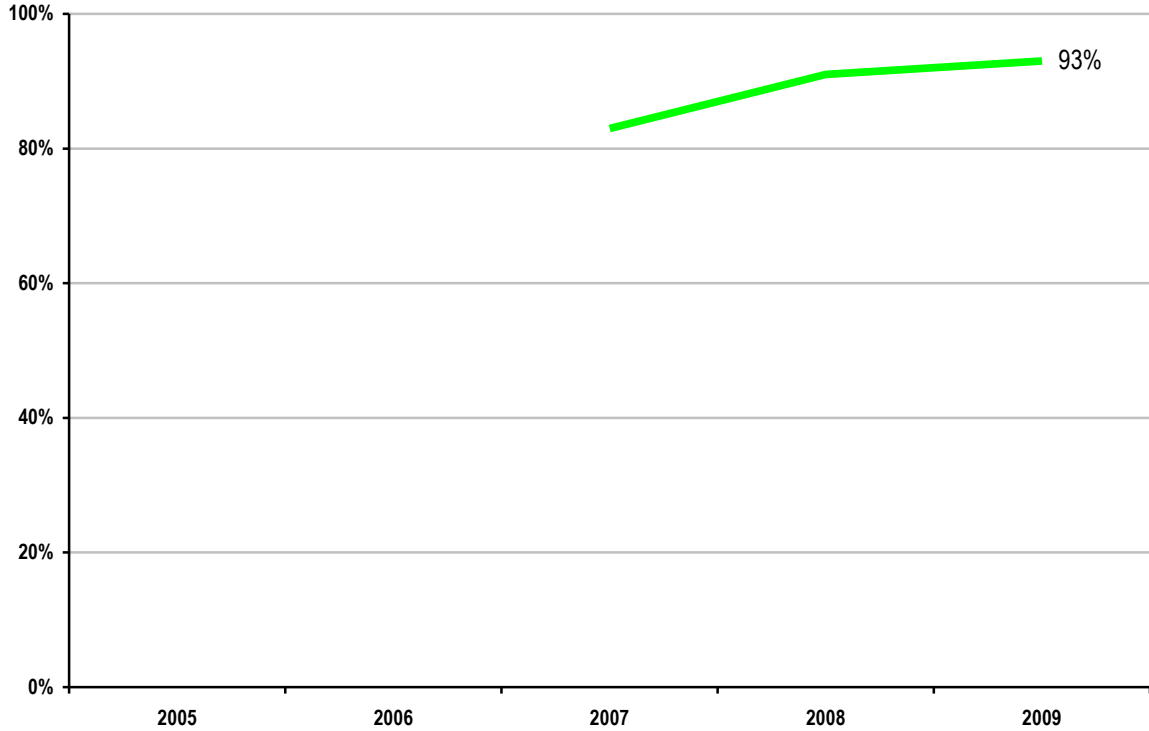
California ISO Annual Administrative Charges per Megawatt Hour of Load Served 2005-2009
(\$/megawatt-hour)



Customer Satisfaction

The California ISO does not use a single client satisfaction metric for developing business improvement initiatives because of the metric's limitations. Instead, the ISO uses a variety of survey instruments to test stakeholder satisfaction. Among these instruments are "transactional surveys" to gauge stakeholder satisfaction with specific projects or stakeholder processes, "corporate surveys" to annually sample senior-level stakeholders across multiple ISO business areas, and "touch point mapping exercises" in which the ISO drills deeply to better understand business interactions with its customers. Although these surveys yield no single stakeholder satisfaction score, the ISO asks two questions on overall stakeholder satisfaction within the annual executive-level corporate survey. The graphic below presents these scores for the past three years.

California ISO Percentage of Satisfied Members 2005-2009



Billing Controls

The California ISO received two unqualified opinions following implementation of its new market design in 2009. This is a testament to the completeness and accuracy of the controls operating in this complex new environment.

ISO/RTO	2005	2006	2007	2008	2009
California ISO	Qualification for Two Control Objectives in SAS 70 Type 2 Audit	Unqualified SAS 70 Type 2 Audit Opinion	Qualification for Two Control Objectives in SAS 70 Type 2 Audit	Qualification for One Control Objective in SAS 70 Type 2 Audit	Unqualified SAS 70 Type 1 and Type 2 Audit Opinions

D. California ISO Specific Initiatives

Each year the California ISO establishes, with Board approval, annual corporate goals as part of its strategic planning process. The annual goals measure short-term performance and targeted areas of focus or improvement in a given year. In parallel time, the ISO assesses long-term performance in achieving the objectives identified in the strategic plan. The following performance highlights are a collection of short and long-term performance achievements over the past five years (2005-2009) in the three areas covered by the ISO/RTO metrics in this report.

Reliability

The ISO measures reliability in terms of compliance with operations and planning standards as well as cost. In some cases, meeting the requirements is absolute while for others, some discretion exists in how to achieve a particular result. When exercising such discretion, the ISO keeps the cost impacts in mind while maintaining expected levels of reliability.

- **Renewables Planning.** The ISO has a long history of planning for renewables integration dating back to 2001 when its Participating Intermittent Resource Program was approved by the Board, and later with conditions by the FERC. The program, which responded to state rules establishing a 20 percent renewables portfolio standard, allows intermittent resources, such as wind and solar resources, to schedule energy in the ISO forward market without incurring imbalance charges when the delivered energy differs from the scheduled amount.

In 2006, the ISO proposed, and the FERC accepted in 2007, the Location Constrained Resource Interconnection financing tool, which eases the financial burden of renewable project developers by allocating the costs to multiple generators connecting to the same facilities as they come on line.

In 2008 and 2009, the ISO stepped up its activities by collaborating with vendors, utilities and state agencies to conduct test pilots. The ISO is participating in the Western Electricity's Coordinating Council's Western Interconnection Synchrophasor Program, which leverages a mature technology in new ways critical in managing the renewable resources, including electric vehicles charging (and storage).

The ISO also participated in seven storage pilots in 2008-2009 that investigated several different things including how battery storage can help match renewables generation with available transmission capacity and how to best use storage for regulation, spinning reserves and frequency response.

The Board approved the Proxy Demand Response proposal in late 2009 that set forth the conditions in which aggregators and load-serving entities could bid demand reductions into the ISO markets, and the ISO expects to follow with the reliability demand response product to integrate emergency responsive demand into ISO markets and operations.

- **Reduced Reliability Management Costs.** The ISO targeted over \$1 billion of reliability management costs in 2004 and reduced this figure to \$154 million in 2007. It achieved this reduction by optimizing operator commitments through

targeted reliability management process changes. The ISO relied less on reliability must-run plants in recent years and especially from 2007 to 2009 with costs decreasing nearly 68 percent to \$39 million.

- **Maintaining Reliability Under Extreme Operating Conditions.** The ISO developed a wildfire tracking information system that combined Google Earth, California Department of Forestry and Fire Protection real-time information, and grid topology that displays pinpoint views of threats to the grid. *POWERGRID International* (formerly *Utility Automation & Engineering T&D*) magazine awarded the warning system its 2007 Project of the Year Award.
- **Interconnection Process Improvements.** The ISO enhanced its interconnection processes that benefit the ISO and its customers in significant ways. The 2008 queue reform reduced the large number of projects requesting interconnections down to a manageable and more meaningful number. By reforming our study processes three times in three years helps ensure applicants are serious while avoiding imposition of fees that could cause otherwise promising, viable projects to fail. And by studying geographically and electrically related requests in clusters, the ISO was able to cut review time by 60 percent.
- **Generation.** More than 2,400 MW of new generation came on line in 2009 — the most since 2005. Generation additions 2006 to 2008 totaled less than 600 MW each year.
- **Transmission Planning Process Improvements.** The ISO revised planning proposals are being designed to mitigate stranded costs risks as development patterns change, making sure that the regulatory compliant process addresses reliability needs and, for the first time, state energy and environmental goals. The planning reform initiatives are successful because of the extraordinary effort our stakeholders and market participants have devoted to designing the rules. The ISO employed in 2004 the first in the nation economic methodology for evaluating the benefits of transmission called the Transmission Economic Analysis Methodology which improved the accuracy of the evaluation, and added greater predictability to the evaluations of transmission need conducted at various agencies.
- **Transmission.** If built as expected, the ISO has approved four major transmission projects, which together have a capacity of 12,300 MW, that will accommodate energy load-serving entities need to meet the state's 20 percent by 2010 renewables portfolio standard.
- **Compliance.** The ISO has strengthened its compliance efforts over the past few years despite challenging operating conditions (wildfires, loop flows from early spring melts, etc.), and implementing resource adequacy requirements. The ISO has had successful compliance audits, including in 2008, when the ISO created a new compliance department. In 2009, spot check auditors from the Western Electricity Coordinating Council found no violations, and they noted no audited entity had achieved such a feat.

Markets

In April 2009, the ISO implemented a new market, referred to in its development stage as the Market Redesign and Technology Upgrade. This effort required significant company resources and focused leadership management. To put this accomplishment in perspective the following highlights are noted:

- **Significant New Functionality.** The scope of the new market functionality was significant, including congestion revenue rights, a day-ahead market and locational marginal pricing. The new market is more transparent and granular and the pricing at its 3,000 nodes better reflects the energy's production and delivery costs.
- **Extensive Outreach and Collaboration.** The ISO conducted extensive outreach to fully support market participants as they tested their systems to ensure new market readiness. The result of this activity was increasing confidence in ISO systems and creating unprecedented collaboration that persists even now. This led the ISO to hold its inaugural Stakeholder Symposium in the fall of 2009 that drew 210 people that promoted open dialogue with members of the Board of Governors and ISO executives. The ISO also held several forums to discuss pressing issues.
- **Continued Functionality Deployment.** The ISO developed nine additional enhancements that are ready for deployment (some are pending approval). The higher priority enhancements were scarcity pricing and convergence bidding; multi-stage generator unit modeling; resource adequacy standard capacity product; and ancillary services must offer obligation. To further support our market participants as they upgrade their systems and processes to deploy new market functionalities, the ISO began holding quarterly stakeholder meetings to discuss implementation issues and schedules.

Organizational Effectiveness

Beyond cost and customer satisfaction measures, the ISO also focused on developing its people, business processes and technology capabilities. Indeed, these enabling activities are essential to meeting expectations with respect to the operations and markets metrics included in the report, all at a reasonable cost.

- **People.** The ISO developed and launched a technical training program to develop critical skills needed by operators and engineers to manage a more complex grid. It also established the President's Leadership Academy that trains participants to make better business decisions and grow their leadership skills. Human Resources implemented a comprehensive talent management strategy that reduces voluntary turnover and a global recruitment program.
- **Process.** The single biggest improvement effort in this area has focused on building a culture of customer service that included deploying an issue tracking system with performance metrics. Resolving issues now requires less than five business days on average despite having a new and complex market platform. An August 2008 comprehensive customer survey, among other things, led the ISO to develop a set of criteria to measure the timeliness of document publication and the effectiveness of those documents in informing stakeholders.
- **Technology.** The ISO continues to enhance situational awareness through development of a modernized control center in our new headquarters. It will feature a video wall pre-programmed to display critical operating information, including the status of renewable resources. In 2006, several advanced technologies were deployed in ISO control rooms to enhance grid management, including the State Estimator that allows the ISO to see beyond its footprint to better gauge system conditions.

- **Financial.** The ISO began to aggressively manage its revenue requirement in 2005 with a corporate realignment that resulted in a \$27 million drop in 2006. Since that time, the ISO has been able to hold its revenue requirement to below the \$197 million threshold that triggers a rate filing. In 2008, the ISO agreed with stakeholders that its payment schedule was long and exposed customers to unnecessary credit risk and implemented in 2009 its payment acceleration process. The new system reduced average cash clearing time to 17 business days from 56, and shaved settlements publication time to 7 business days from 38.