**Comments of Paramount Energy West LLC**

Paramount Energy West LLC is a Nevada Corporation

There are certain policy questions that must be answered before any definitive answers or comments are considered on the CAISO proposal. First what is the overarching objective of the storage program? Is it least cost, greatest system reliability, statewide reduction of CO2, or the improvement of ambient air quality? These need be ranked because a solution that minimizes cost probably will not provide improvement in air quality since the so called least "cash cost " solutions will not provide any significant improvement in PM10/2.5 pollutants which is California's biggest air pollution problem nor will the lowest "cash cost" provide any relief on the water usage front. FERC Commissioner Tony Clarke has highlighted the crossroads of cost and environmental quality at the National Energy Marketers Assn's 19th Annual National Energy Restructuring Conference. The least cost solution to the entire range of air, water, transportation and power requirements will most likely not be the lowest cost solution for one area.

GRID OPERATIONS DO NOT EXIST ISOLATED FROM THE OUTSIDE WORLD

Benefits forgone by a least cost strategy include a major reduction of natural gas currently burned to produce H2 for refinery usage. The opportunity to improve system fuel efficiency. Houston Lighting and Company demonstrated from 1971-1973 a 2.5%(30bcf) reduction in system wide fuel use by using electrolyzer as a dispatchable load (+/-200mw in 10 cycles/+/-400mw in 10 minutes) minimizing the load following adjustments of natural gas fired generation. Adjustments of generation levels once every 15 minutes resulted in no deterioration of system voltage or frequency. A least "cash cost" will forgo the opportunity to reduce cooling water demand. The side benefits to HL&P's fuel reaction were a simultaneous reduction in cooling water used by the power plants due to lower thermal loads http://interactioncouncil.org/water-impacts-energy-security-0 and less need for spinning reserve . The system was limited by telecommunications of the time and operated on roughly a 10-15 cycle basis. This was a no cost benefit to HL&P and resulted in lower rates for the participating industrial customers. Since then, the Ontario IESO in conduction with Hydrogenics has demonstrated that this lag can be reduced to the same time as the AGC signal from dispatch. Properly designed and used storage can reduce fuel consumption, net water usage, and air emissions. The proposal shows no consideration of any co-benefit to California not directly received by the grid. Electrolysis for H2 production would, if properly executed, also decarbonize motor fuels used in California and reduce PM10/2.5 by producing alternative fuels. This is an example of one kind of co-benefit associated with one type of load management can generate that is not available with other types of resources. If storage only rather than storage and load management is relied on exclusively, then a suboptimal solution on a macroeconomic

scale for the State of California as a whole is reached. As Carnegie Mellon University has demonstrated the use of car battery charging at night may be good for grid management purposes but for environmental reasons a bad decision.
https://www.sciencedaily.com/releases/2016/02/160222144556.htm
This directly contradicts previous assumptions made in the past.
https://www.sciencedaily.com/releases/2011/04/110418201736.htm
Reductions in rates trumpeted by ERCOT as benefits of deregulation really mask the termination of Reliability Must Run payments previously made to guarantee system stability.

The United States became the industrial colossus of the world during World War II in part because the War Production Board made decisions on which company made what goods and where. Examples include the move of the B-24 production from San Diego to River Rouge Michigan, The TBF Avenger from Grumman on Long Island to GM's Eastern Aviation in Schenectady New York and the manufacture of the Jeep designed by Bantam American Motors by Willys Overland. Part of this was driven by an external need to optimize electric power and to allocate 14% of wartime electric generation to the Manhattan Project.

A decision must be made whether only microeconomic effects affecting only the grid are considered or whether external effects that transcend the grid are to be considered. An example of externalities is the ERCOT decision to build new coal fired plants in Texas despite a Carnegie Mellon study showing that coal transportation from Wyoming to Texas required 5 gallons of diesel per ton on a round trip for a unit train. This also required the annual importation of an additional 250 000 barrels of crude to be refined to diesel per power plant and increased the trade deficit by $25million annually.

The next issue that must be considered is cost shifting. In 1973, 62% of all kilowatt hours sold by HL&P went to industrial customer SIC codes, 15% went to commercial SIC codes and 22% to residential SIC codes. 45 industrial customers owned their own substation and received service at 138kv or 345kv. Beginning in 1976 rates designed by the Public Utility Commission of Texas in their first attempt to set transmission rates made it economically advantageous for industrial customers accounting for 44% of HL&P's annual kWh sales in the 1975 test year to convert to self-generation or in the case of Armco Steel, US Steel and Trinity Portland Cement to move production elsewhere. By the end of 1983 the LOS-3 rate customers >20mw, LOS-2 customers> 40 mw and the LOS-B customers >60mw and 75% load factor were all gone. LGS customers such as American Rice Mills whose 11 mw load and 92% load factor and Rice University 7mw load and 74% load factor had converted as well. By 1983, small industrial<5mw, commercial and residential customers or the State of Texas were the only ones left to pick up costs previously borne by larger customers. Decision makers must consider possible collateral damage to customers they are trying to help. The optimal solution is not always the obvious one.

Issues in the CAISO ISSUE Paper

3.1 NGR Enhancements

This discussion misses why renewables are being substituted for fossil fuel generation. Policy should be coordinated with policy initiatives of the ARB and the CEC.

Secondly, short run cost optimization was a material element in the ERCOT blackout of February 2, 2011, they were also major considerations on August 4, 2011 and 24, 2011. The NERC in its 2010, 2011, and 2012 Long Term Assessments of ERCOT and in a letter dated January 7, 2013 expressed its concern about inadequacy of ERCOT's short term least cost strategy. "Therefore, I am requesting that you report to NERC, no later than April 30, 2013, ERCOT's plan to address the declining reserve margin and projected capacity shortfall, including a discussion of the risks to reliability if new resources are not constructed or acquired in the short term. ". http://www.ercot.com/content/news/presentations/2013/NERClettertoTripDoggettonResourceAdequacyJan72013.pdf It is important to note that noncompetitive market suppliers such as Austin Energy, CPS Energy, South Texas Electric Coop, Brazos Electric Coop, Brownsville PUB, City of Bryan, City of Garland, Medina Electric Coop, San Miguel Electric Coop, and the University of Texas Austin were all asked to divert power to the competitive market and curtail their rate base customers. Absent these exempt system operators who represent nearly 100% of ERCOT system reserves, the entire ERCOT grid would have blacked out numerous times. THE CANCELLATION OF RMR PAYMENTS BY THE PUCT TEXAS HAS COMPROMISED THE RELIABILITY OF ERCOT AND DE FACTO SHIFTED COSTS OF MAINTAINING GRID RELIABILITY TO CUSTOMERS OF THE COOP AND MUNICIPAL UTILITIES EXEMPT FROM PUCT MARKET DEREGULATION. Portions of the CAISO proposal run these same risks. http://www.ercot.com/content/gridinfo/resource/2015/mktanalysis/Brattle_ERCOT_Resource_Adequacy_Review_2012-06-01.pdf

3.2 Demand Response Enhancements

This is a market (up and down dispatch) that CAISO should encourage. HL&P was able to use this mechanism to reduce natural gas usage by 30 bcf in 1973 by reducing the btu/kWh by 240 btus. This reduced CO2 by 3.5million pounds. It also reduced NOx and PM10 by 1200 tons.

Bidding for this service would be counterproductive since no auction mechanism would properly or accurately allocate pollution reduction, reduced water usage, or value of carbon reduction. Auctions would discourage this innovative type of solution;. Also location of the facility and operating hours/conditions would render the value of a cash bid useless. This is one where a negotiated rate that is fair to both parties is far superior to trying to guess a rate every 10 cycles

which is what the response rate has been demonstrated to be. In HL&P's case a 1 mw change at Diamond's Battleground or Monument plants on the Houston Ship Channel between Sam Berton and Deepwater plants on one circuit or Greens Bayou some 8 miles away across the channel on the second circuit feed was more valuable than a 1mw change at Dow Chemical in Freeport some 80 circuit miles away at the end of three 138kv lines.

Also quick reacting storage will allow dispatchers to use other storage with differing operating characteristics to allow each operate at its respective optimal characteristic. This ability to optimize the characteristics of each class of storage will enhance the overall benefits including improvement in air quality, reduction in water usage, reduction in carbon produced both by the grid and by transportation.

Also the study by Rocky Mountain Institute confuses the benefits of this type of service. HL&P found that agreements with Amoco Oil Co.'s Texas City refinery and the Marathon Petroleum Texas City refinery (both indirect customers through HL&P's sale to Community Public Service/ Texas New Mexico Power Company who resold to Amoco and Marathon) carried the same operational benefits as direct agreements with Shell, Exxon, Crown Central and ARCO. HL&P also found the rate impacts and operational handicaps of Amoco and Marathon deciding to convert to self-generation were identical to direct customers Exxon and Shell leaving the system. The laws of physics do not respect property lines and the benefits are the same for purposes of dispatching the grid. Depending on where control is established will decide the impact. If the ISO has access to control then the facilities are functionally identical for operational purposes and rate making purposes. Please remember after FERC vs Electric Power Supply Association, http://www.supremecourt.gov/opinions/15pdf/14-840_k537.pdf the FERC will be the final arbiter of how this is done subject to review by the Council on Environmental Qaulity pursuant to Executive Orders and judicial review.

MUTUALLY EXCLUSIVE CAPACITY AND ENERGY

The statements may be true for solid state devices but for synchronous generators and condensers the statement is false. For a real world example use the Greens Bayou #5 unit. Name plate is 465 megawatts. Due to a design error on the wet bulb temperature for the steam condenser, the unit is limited to 406mw of real power. Since total power is the vector sum of real power plus reactive power the unit is capable of generating 226MVAR which is available for ancillary services without impinging on its operational rating of 406mw of real power. The combined total of 406 mw and 226mvar may each be contracted separately. The 406mw for mw energy and the 226mvar for ancillary services. I am somewhat confused by what is meant here, but for dynamic synchronous services it does not appear to comply with NERC standard VAR001-2.Similarly a 765mva generator that has sufficient power for 750mw out put may still contract for 150MVAR in ancillary services and stay within IEEE standards. For synchronous

machines the capacity rating is independent of the mw rating so long as the vector sum of the two does not exceed the MVA rating of the synchronous generator. From IEEE Spectrum: “Severe voltage drops, for example, hobble SVCs, whose reactive power output drops at double the rate of line voltage. In contrast, a synchronous condenser’s spinning rotor keeps on pumping out reactive power. It will also generate real power if needed, moderating the drop in AC frequency that would result, say, from shutting down a power plant...

“And the condenser’s output can briefly handle several times its rated capacity for tens of seconds as its metal components heat up temporarily—behavior that is not possible for devices relying on comparatively fragile silicon switches. “Because they’re iron and copper, they have a lot of overload capability. You can’t overload silicon significantly,” says Nicholas Miller, a power systems expert with GE Energy Consulting, in Schenectady, N.Y.”

To the extent that the comments are directed to solid sate devices , the comments have merit. But if applied to mechanical synchronous devices they are not valid and there is no double compensation. Controlling frequency by using reactive power is superior to using mw power. Instructional literature for the IEEE Generation and System Protection and Relaying course as taught in 1975 compared frequency control by using megawatts to trying to treat a gunshot would with a bandaid when reactive options are available.

3.4 Distinction Between Charging and Station Power

I am not sure what point is being made here. The US Supreme Court has said electrons are electrons no matter what book keeping legerdemain is engaged in. FPS vs Florida P&L https://supreme.justia.com/cases/federal/us/404/453/case.html. A similar result of no discriminatory treatment has been barred under the “Bluewater Header” credits on Tennessee Gas Pipeline for the transportation of liquids and makeup gas from the OCS to processing plants on shore. 1968. This non discriminatory standard on a btu basis is now common to all pipelines transporting gas liquids and liquifiables to shore for processing. The non discrimination has been upheld repeatedly by the DC Circuit. In Bear Creek Storage 48 FERC61.216 1988 the base gas and operating gas are fungible so there is no legal basis for discriminatory rate treatment between the two. The same will be true of any FERC jurisdictional facilities for electric storage. The CPUC would have to justify to the satisfaction of the FERC(post FERC vs EPSA) a different resolution for facilities on distribution lines or behind the customer meter.

3.5 Review Allocation of Transmission Access Charge Load served by DER

This issue has been litigated in the context of Bear Creek Storage for natural gas. The problem is that the ISO could be found to be double charging demand charges for the same unit of energy ultimately delivered to an end user. For example Boston Gas has firm capacity on Tennessee

Gas Pipeline. It must use 70% of its reserved capacity monthly or pay the capacity charge for Zone 6 any way. If it uses more than its minimum requirement for deliveries to the NYC area but has additional volumes that are delivered to a contract storage facility like Bear Creek in April of year 1, Boston Gas must either pay the per mcf reservation fee then and when peak season comes (February) it is only obligated to pay the commodity portion of the rate to have its stored gas delivered so long as it otherwise meets its monthly minimum under Tennessee's tariff. Otherwise it is being charged twice for reserved capacity from the Gulf Coast Market Area to Zone 6. In addition Boston must pay at the time of storage the commodity charge per 100 miles from its receipt point (Agua Dulce for example) to Bear Creek. And at the time of withdrawal the commodity charge from Bear creek to Zone 6. If a marketer who does not have firm capacity buys the gas at Agua Dulce and ships to Bear Creek, the marketer pays an interruptible transportation fee which covers commodity charges and some contribution to demand costs. Then when the marketer sells to Boston Gas at Bear Creek, Boston must pay its full Zone 6 rate. Now since there is a potential for a windfall to the transporting pipeline, there is a "true up "audit where by excess earnings over and above the Just and Reasonable rate are audited and refunds ordered if there are excess earnings. The CAISO proposal is an open door to that kind of FERC review.

Also the ISO may find itself after FERC review in the position where if the storage is located at the distribution substation buss and captures excess solar in the morning that it will owe the storage facility for the value of the I*2R losses not incurred by the solar going through the distribution substation onto the grid and then to another distribution substation and out onto the distribution system for immediate use. Then in the late evening the ISO will owe for the return of the power on the distribution buss of the substation for the net kilowatt hours after storage times the I*2R losses avoided for both reactive and energy power from a power plant to the distribution substation plus the value of transmission capacity not used.

This is Pandora 's Box that should be opened only reluctantly.