Department of Water and Power | the City of Los Angeles

March 2, 2009

California Energy Commission
Docket Office
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

Gentlemen:

Subject: Electricity Resource Plans (Docket 09-IEP-1B) and Electricity Demand Forecasts (Docket 09-IEP-1C) Data Submittal for the California Energy Commission (CEC) 2009 Integrated Energy Policy Report (IEPR)

This is in response to CEC's data request related to the Electricity Resource Plans and Electricity Demand Forecasts for municipal utilities. The Los Angeles Department of Water and Power (LADWP) requested an extension of the due date to March 2, 2009, and said request was approved by the CEC.

This enclosure contains the latest and most accurate information available. The LADWP continues to pursue an aggressive renewable portfolio standard and to evaluate opportunities to reduce its greenhouse gas emissions. As a result, we will consider amendments to our resource plans as may be necessary.

Further, it is important to emphasize that this data is speculative at this point; there has been no validation, authorization and approval by the Board of Water and Power Commissioners and the Los Angeles City Council. As we move forward with our resource plans and obtain final approvals from our governing authorities, and to the extent that this data is modified, changes will be provided to CEC staff as soon as possible while the 2009 IEPR is being developed.

An electronic file was also submitted to Docket@energy.state.ca.us on March 2, 2009.

LADWP believes that this submittal fully complies with all the requirements of the CEC data request and continues to look forward to working with CEC staff in this and other matters.

If additional information is necessary concerning this matter, please contact Mr. Oscar A. Alvarez at (213) 367-0677 or Mr. Than Aung at (213) 367-3367.

Sincerely,

Aram Benyamin
Senior Assistant General Manager -
Power System

OAA:ms
Enclosures
c/enc: Mr. Oscar A. Alvarez
Mr. Than T. Aung

Overview

The Retail Sales and Demand Forecast (Forecast) is a 20-year projection of electrical energy consumption, peak demands and energy production in the City of Los Angeles and Owens Valley.

Signature Authority

The Chief Operating Officer - Power System and the Chief Financial Officer have final signature authority on the Retail Sales and Peak Demand Forecast (Forecast).

Schedule

The signed Forecast is published once a year usually in late November or early December. It includes actual data through September of the forecast year. September sales data is usually available by tenth day of October. The Forecast is labeled the “October” forecast to signify the time period when the forecast work is performed.

Management reserves the right to revise and publish a signed Forecast at anytime. Forecasts are subject to the economic phenomenon of displacement. A displacement is an external shock to a system pushing the System off its current trends and establishing new relationships among variables. Two historic displacements for LADWP were the Northridge earthquake and the California Energy Crisis. After such an event, Management may require a new Forecast.

Peer Review

The Peer Review Process evolved as a way to meet the PricewaterhouseCoopers audit recommendation that the Load Forecast be transparent. The Peer Review Group includes primarily the principal users of the Forecast. Peer Review may be somewhat of a misnomer since Management is involved in the process. The main goal of the Peer Review Process is to vet the Forecast. The Forecasting Group presents its assumptions to its Peers to build consensus. The other major outcome to the Peer Review Process is to review the reasonableness of the Forecast. Peers make good reviewers because they understand how change in the forecast can affect their area of influence. Criticism of the Forecast can be communicated either directly to the Forecast group or through management channels. Out of the Peer Review Process evolves the final forecast for senior management to review and sign.

End Users

The signed Forecast is distributed throughout LADWP and the Power System. Primary internal users include:

Financial Planning & Scenario Development – Revenue forecast and Fuel Budget
Integrated Resource Planning
Wholesale Marketing & Analysis
Distribution planning
Transmission Planning

Externally the forecast is required to be sent either annually or biannually to:

Energy Information Agency
California Energy Commission
Western States Coordinating Council

Customer Classes

LADWP forecasts six customer sectors – Residential, Commercial, Industrial, Streetlighting, Intradepartmental and Owens Valley.

The Residential sector includes single family and multifamily residences, the common areas of apartment and condominium buildings and a small amount of outdoor area lighting. Residences are billed under the R-1 rates while common areas are billed under the general service rates.

The Commercial sector includes commercial buildings and TCUND and a small amount of outdoor area lighting. The customers are billed under the general service rates according to size. There are rate contracts for selected large customers.

The Industrial sector includes all manufacturing, oil pumping and construction firms. All industrial customers are billed under the general service rates. There are rate contracts for selected large customers.

Streetlighting includes all private and utility-owned streetlights as well as all traffic lights. Streetlight lights are bill under the LS rate schedules. The city is not charged for the traffic light system but the consumption is recorded as a retail sale.

Intradepartmental sales include all sales to the Water System. The activity is primarily water pumping but there is also electricity consumed by office buildings and maintenance yards. The Water System is billed under the general service rates.

Owens Valley is considered as an isolated geographic sector. It includes all the above customer class sectors but is forecast as a single entity. There is very little private land available in Owens Valley so development is limited. Variance in electricity growth in the Owens Valley is noise in the LADWP forecast. All rate classes are used.

Demographics

Data Sources

Primary

State of California, Department of Finance

Background

US Census
US Census American Community Survey
UCLA Anderson Forecast
Southern California Area Government
City of Los Angeles Planning Department

Population Forecast Methodology

The key input in the population forecast is the State of California Department of Finance (DOF) population forecast for the County of Los Angeles[1]. The advantage of using the DOF forecast is that it is used by the other utilities and planning authorities within the State.

In the October 2007 Forecast, a new trend was identified that population in the City is growing at a faster rate than the County as a whole. The reported population on December 31, 2007 confirmed the trend[2].

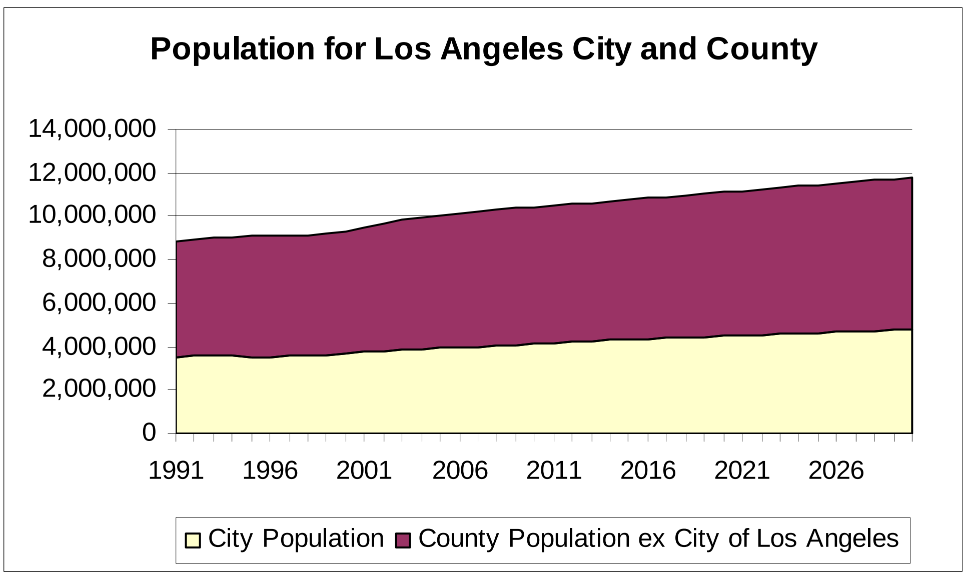
Year over Year Population Growth		
Year Ending	County	City
December 31, 2000	1.91%	1.81%
December 31, 2001	1.68%	1.60%
December 31, 2002	1.51%	1.41%
December 31, 2003	1.18%	1.18%
December 31, 2004	0.86%	0.83%
December 31, 2005	0.59%	0.85%
December 31, 2006	0.51%	0.73%
December 31, 2007	0.87%	1.25%

[1] State of California, Department of Finance, *Population Projections for California and Its Counties 2000-2050,* Sacramento, California, July 2007
[2] State of California, Department of Finance*, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark.* Sacramento, California, May 2008

The population in the City is about 37% of the population in the County. This new trend reverses a long-term pattern where growth in the suburbs was occurring at faster rate than in the City. In our opinion, the new trend can be attributed to three factors:

1. There is a higher percentage of ethnic population in the City with higher fertility rates versus the County.
2. Since 2003, over 50% of new housing units have been built in the City as compared to the County and we expect this trend to continue.
3. Out-migration will slow until issues in the credit markets are resolved. One group within the population that is out-migrating is people buying affordable homes in Riverside and San Bernardino counties.

The forecast is for population in the City to grow faster than the County forecast through 2020. After 2020, we adopt the DOF LA County population growth rate. The net result is that we grow population in the City through 2020 at a 0.8% rate whereas the County is growing at a 0.6% rate. The population growth rate after 2020 is 0.61%. The graph below shows the relationship between City and County population growth.



The risks in the population forecasts are:

1. Fertility rates that are higher than normally found in a developed economy falling rapidly in the forecast time period.
2. A deep recession would lower foreign immigration.
3. New immigration laws enacted which slow the pace of foreign immigration.
4. An external shock that causes a large out-migration.

Economic Forecast

<u>Data Sources</u>

Primary

UCLA Anderson Forecast
State of California, Economic Development Department, Labor Market Information
McGraw-Hill Construction Forecast

Background

US Census American Community Survey
Los Angeles Economic Development Council (LAEDC)
Barrons, BusinessWeek, The Economist and other Business Journals

<u>City of Los Angeles - Los Angeles County Split Methodology</u>

Economic data is commonly aggregated at the Metropolitan Statistical Area (MSA). The current local MSA includes both Los Angeles and Orange counties. Before 2004, the MSA included only Los Angeles County. Fortunately, Los Angeles County is a large enough entity that numbers are still being reported at the County level.

The LADWP service includes only the City of Los Angeles and Owens Valley. Since Owens Valley is a slow growth area, LADWP forecasts Owens Valley as a separate sales class. The problem then is to apportion economic data between City of Los Angeles and the rest of Los Angeles County.

The basic technique is to trend a ratio of an economic variable between city and county.

The naïve approach is to assume that the City and County are growing at the same rates. This is the constant trend approach. In the absence of better information this is the assumption used. However, it is clear that in the recent decades suburban Los Angeles County historically has grown faster than Central Los Angeles County defining Los Angeles Center as being the Los Angeles Civic Center. This trend may be reversing as we are now seeing more construction being built as infill.

The other commonly used method is apportioning economic growth by population. The long-term trend has been that City of Los Angeles population is a declining proportion of Los Angeles County population. However, we are forecasting this trend to reverse.

The other key share analysis is in the construction data. Here City of Los Angeles building permit data is compared to the Los Angeles County data.

Employment Forecast Methodology

The basis for the forecast is the UCLA Anderson Forecast. For employment, LADWP assumes a constant share of Los Angeles County employment. We have attempted to forecast City employment only but found the time series to be too erratic to make definitive conclusions. UCLA Anderson's employment forecast is seasonally adjusted. However in the LADWP sales forecast we want to capture seasonal effects. Therefore we use non-seasonally adjusted data historical data from the EDD and preserve the seasonally influences by using UCLA Anderson YOY employment growth rates rather than the actual forecast itself.

Lower-level detail data is available if needed but forecasts are developed for the following high-level NAICS codes:

Natural Resources
Construction
Manufacturing
Trade, Retail and Utilities
Information
Finance
Professional
Education & Health
Leisure & Hospitality
Other
Government

Based on the Payroll Survey**,** Los Angeles County lost 23600 jobs since September 2007. In the October 2007 forecast, the employment was for an increase in 51000 jobs. The number of jobs in the formal sector of the economy is below the pinnacle reached in 2000. Over the budget horizon, UCLA Anderson forecasts jobs to increase at a rate of 46224 jobs a year or a 1.3% growth rate. However in 2009, the forecast is for employment to continue to decline through June. UCLA Anderson, however, has warned that future forecasts could turn lower if the current economic crisis continues to expand.

Real Personal Income Forecast Methodology

The basis for the forecast is the UCLA Anderson Forecast. LADWP assumes a constant share of Los Angeles County personal income. We acknowledge that incomes within the city are below that other county. A potential source of analysis on this issue is the American Community Survey. However since the survey data has only been conducted annually since 2001, the confidence intervals on the analysis are still too large to make definitive statements. As more data is collected, these problems should correct.

Real personal income grew at a rate of 4.2% between July 1996 and July 2000. It was a period of economic expansion associated with the birth of the Internet. Ed Leamer of the

UCLA Anderson coined the term the “Internet Rush” to describe the period, likening it to the California Gold Rush in the nineteenth century. Calendar Year 2000 was a transition year economically and growth since 2000 has been much slower. From July 2000 to July 2008, growth in real personal income was only 1.27 percent per year. For the years 2008 to 2010, UCLA Anderson forecasts that real personal income will continue on the trend of 1.3 percent growth with most of that growth occurring in 2010. After 2010, growth in real personal income is 2.7% which is equivalent to the long-term economic growth in the united States.. In comparison to the October 2007 Forecast, Real Personal Income is lower in the first two years whereas the long-term growth is virtually unchanged.

Household Consumption Forecast Methodology

Standard electric utility industry practice is to use Real Personal Income as the economic driver in the Residential Sales model. In the LADWP service area, this traditional relationship has decoupled over the past ten years. In fact, over the past ten years, electric consumption and Real Personal Income is inversely correlated which is unexpected and not a relationship in our opinion that will hold over the long run. Therefore consumption was substituted for Real Personal Income in the residential sales model. Electric consumption and total consumption are positively correlated over the past ten years. The relationship between Consumption and Real Personal Income is as follows:

Consumption = Real Personal Income (1 – Savings Rate) (1 – Tax Rate) + Transfers

The cause of consumption growing faster than personal income is due to a lowering of the saving rates. Saving rates actually turned slightly negative for a brief period meaning that people are consuming more than they have available from disposable income (income after tax and transfers). The saving rate turned negative is attributed to the wealth effect. The great boom in real estate values, some say bubble, increased household wealth over the last ten years. Equity in the house became the household savings account.

The forecast is that saving rates will increase and again turn positive as households reduce their debt. There is anecdotal evidence that banks are decreasing borrowing limits on credit cards which forces households to increase savings. Paying down house mortgages is also a form of savings that is expected to become the trend.

Lower household consumption means electric consumption will increase at slower rate in the future when compared to the recent past.

Housing Forecast Methodology

The US Census Bureau's American Community Survey is used to benchmark the time series[3]. The data is available annually. To convert it to months, we use linear extrapolation.

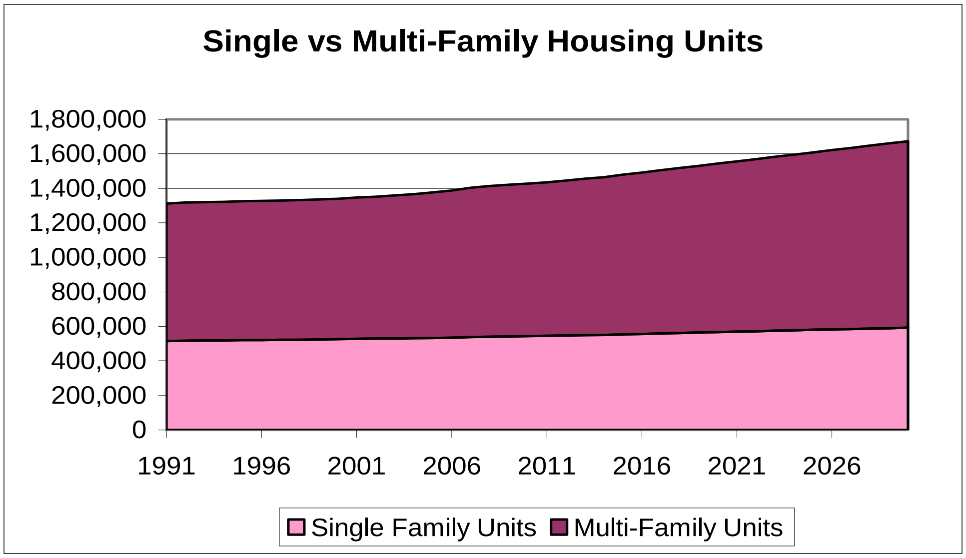
For the first five years of the Forecast, the housing is viewed from the supply side and is based on the McGraw-Hill Construction forecast for Los Angeles County.

Because most of the new construction in the LADWP service area is infill requiring complex planning, receiving a building permit in Los Angeles can take as long as thirty months. Once the permit is received it takes four months to build a single-family unit and nine months to build a multi-family unit. Short-term forecasts for new housing tend to be fairly accurate due to this long construction cycle. After 2013, following City of Los Angeles Planning Department policy, the housing forecast shifts to the projected demand. Currently, the projected demand for housing of 13,000 units per year which is based the Mayor's "Housing that Works" policy statement. In the October 2007 Forecast, the long-run demand for housing was 10,700 units per year.

Over the next five years, McGraw-Hill Construction has lowered its forecast for number of units to be built in Los Angeles County when compared to the October 2007 Forecast by 5000 units. The Forecast is for 20 percent of the single-family units in the County to be built in the City and 62 percent of the multi-family units. The 4200 units associated with the Grand Avenue project are now expected to be available in 2011. The "Housing That Works" policy is expected to assist in building 10,000 units of the expected 45133 units through 2013.

The forecasted average units added per year over the next five years is 9000 which is higher than historical averages. The average number of units added annually over the last 10 years is 8,444 and over the last twenty years is 6,230. The strategic plan for the city calls for high density dwelling units to be located near transportation centers. We expect to the majority of housing units to be built in the future to be multi-family.

[3] US Census Bureau, American Community Survey, http://factfinder.census.gov/home/saff/main.html?_lang=en



Besides the population risks mentioned above, the other risk to the housing forecast is that the outcome of the restructuring of the housing industry is unknown. The uncertainty in the economy could lead to lower forecasts in the future.

<u>Commercial Floorspace Forecast Methodology</u>

The McGraw-Hill Construction forecast is the basis for the commercial floorspace forecast.

In 2008, LADWP replaced its forty-year historical database with new data purchased from McGraw-Hill. This step makes the historical record consistent with the McGraw-Hill forecast. There is still further work to be done. The next step is to compare the new database with County Assessor records for the LADWP Service area. The decay model also needs to be re-specified.

Although the forecasts are not directly comparable because of the database change, construction activity is still forecasted to be close to what was forecasted in October 2007. There are very large construction projects on the books in the City of Los Angeles. The South Park development is not complete. The Grand Avenue project is still going forward although it has been delayed. There are large projects projected in Hollywood and Century City. LAUSD has a very robust construction plan.

There are two major risks to the commercial floorspace construction activity forecast:

1. Projects could be delayed due to problems in the credit markets. Insurance companies and pension funds have traditionally been a major source of financing for commercial real estate and both sources are having financial difficulties.
2. Several large retail chains have filed for bankruptcy in 2008 such as Mervyns, Circuit City, Linens N Things, and Levitz Furniture. Also several large financial service firms have been consolidated such as Countrywide, Wachovia and

Washington Mutual into larger banks. Vacancy rates for commercial space will rise which could lead in delay in new projects.

Electric Prices

Data Sources

Analysis of Consumption & Earnings
UCLA Anderson Forecast

Electric Price Forecast Methodology

Real electric prices are forecasted to rise in the service area. The prices include the changes to the Energy Cost Adjustment and the Reliability Revenue Recovery mechanism. We assume that the rate restructuring will be revenue neutral. The nominal prices are adjusted for inflation using rates from the UCLA Anderson Forecast.

Price elasticity for the sales sectors can be derived directly from the forecasting models. Price elasticity is -.16, -.07 and -.14 for the Residential, Commercial and Industrial sectors respectively.

Weather and Billing Days

Data Sources

National Weather Service using Weatherbank as consolidator
Pierce College Weather Station
Billing Cycle Schedule

Weather and Billing Days Forecast Methodology

LADWP collects weather from 6 weather stations – Civic Center, Hawthorne, LAX, Burbank, Van Nuys and Woodland Hills. Woodland Hills is a non-automated station run by Pierce College. We have a long history of Woodland Hill's data that we have manually collected. It is considered more representative of Valley weather since it is closer to the floor of the Valley then either Burbank or Van Nuys.

In 1998, Title 20 divided the City of Los Angeles into three climate zones where previous it had only been two. Typically, LADWP uses Civic Center, Woodland Hills and LAX to represent the three zones.

For customers billed monthly, LADWP reads meters on a 21 meter read day cycle. For bimonthly customers, it is a 42 meter read day cycle. To successfully model sales, you need to measure weather by revenue month. To make this measurement, we sum Cooling Degree Days (CDD) and Heating Degree Days (HDD) for each billing cycle. The CDD and HDD are then summed for all the billing cycles in the revenue month.

The number of days in a revenue month will vary depending on number of work days it takes to do a full 21 day billing cycle. The days in the billing cycle are counted in similar manner to the CDD and HDD. The days in each billing cycle are added to give total billing days in the revenue month.

Occasionally LADWP uses average billing days rather than total billing days. To find average, you divide by the number of billing cycles (21 for monthly bills and 42 for bimonthly bills).

LADWP uses a fifteen-year average for CDD, HDD and billing days. The average is developed using Metrix LT software.

The Los Angeles Civic weather station moved on June 20, 1999 from Ducommun just east of City Hall to a site on the USC campus. There has been a 2 degree average difference for maximum daily temperature during the summer months since the move. On extreme days the degree difference is closer to four. Adjustments have been made in the weather data to account for these differences. The adjustments lower the precision of the forecast by an estimated 0.5%. The Peak Demand forecast is the most affected by these differences, and the potential error in the Peak Demand Forecast caused by the weather station adjustments is up to 25 MW.

Sales

Data Sources

Analysis of Consumption and Earnings RP77
Banner Report
Traffic Control Estimate
Power System Consumption and Earning Summary

Methodology

Total Sales to Retail Customers is the base unit from which we forecast. Total Sales to Retail Customers is divided into 6 customer classes:

- Residential
- Commercial
- Industrial
- Intradepartmental Sales
- Streetlight
- Owens Valley

The Forecast customer classes are slightly different than reported by General Accounting but every month the Forecast Group reconciles its total sales number to the Power System Consumption and Earning Summary.

The largest difference is in common area apartment bills. General Accounting categorizes this load as commercial whereas the load is put into residential for forecasting purposes.

Forecasting also treats Owens Valley sales as separate class although in reality it includes Residential, Commercial, Industrial, Intradepartmental and Streetlight sales. The load is small and not growing very fast so to develop a separate model does not meet a cost benefit test.

Sales are reported in revenue month not calendar month.

Net Energy for Load (NEL) and Losses

<u>Data Sources</u>

PowerMaster Database

<u>Methodology</u>

Hourly NEL data is reported by the Energy Accounting group at the Energy Control Center. Load Forecast downloads the hourly data off the PowerMaster database.

Losses are defined NEL minus Total Sales to Ultimate Customers.

Losses from the Load Forecasting perspective include not only the engineering losses associated with the transport and transformation of power but also include Purpose of Enterprise Sales, Energy Theft and energy accruals associated with the billing cycle.

State of California
Energy Action Plan and AB 2021

The largest of the policy impacts on future load growth is the result of the Energy Action Plan. Under the State of California's Energy Action Plan electric utilities must follow a stated loading order. The loading order is as follows:

1. Use energy efficiency and demand response as preferred means of meeting growing energy needs.
2. New generation needs met first by renewable energy resources and distributed generation such as combined heat and power.
3. To the extent the above are unable to satisfy energy and capacity needs, support clean and efficient fossil-fuel fired generation.

In previous forecasts, energy efficiency was treated as a resource in the LADWP planning process. As a resource, energy efficiency was evaluated against other potential resources to meet future load growth. Given that energy efficiency is no longer considered an optional resource, in the Supplemental Forecast the savings to be gained from energy efficiency are included in the Forecast.

AB 2021 codifies the objectives established in the Energy Action Plan. Publicly-owned utilities are required to identify achievable, cost-effective efficiency potential every three years and establish annual targets based on that potential for a 10-year period. In September 2007, the Board adopted the following targets:

LADWP ENERGY EFFICIENCY TARGET GOALS (AB 2021)

FISCAL YEAR	GWH SAVINGS	% OF LOAD	CUM. GWH	% OF LOAD	PEAK MW SAVINGS
2006-2007	68 (Actual Achieved) 58 (Net Savings)*	.2 %	58	.2 %	12
2007-2008	275 *	1.2 %	333	1.4 %	50
2008-2009	315	1.3 %	648	2.7%	58
2009-2010	300	1.2%	948	3.9 %	57
2010-2011	280	1.1 %	1,228	5.0%	55
2011-2012	255	1.0 %	1,483	6.0 %	53
2012-2013	252	1.0 %	1,735	7.0 %	53
2013-2014	252	1.0 %	1,987	8.0 %	53
2014-2015	252	1.0%	2,239	9.0%	53
2015-2016	252	1.0%	2,491	10.0%	53
TOTALS	2,491	10.0 %			497

* Projections are all net values per CEC guidelines.

Energy Independence and Security Act (EISA)

At the Federal level, EISA was signed into law in 2007. In the Forecast, the primary identified effect of EISA in terms of electric consumption occurs in Residential Lighting load. By 2014, all light bulbs will need to reduce their wattage by 28 percent. The decrease in wattage increases to 65 percent by 2020. In the Supplemental, we assume that lighting is currently 16 percent of residential load or 1025 kWh per year. To forecast energy savings, we apply the national Energy Information Agency forecast to the LADWP service area load. By 2020, household lighting load is 615 kWh a year. The reason that you do not see a full 65 percent decline is that EIA assumes that all light bulbs are not replaced. An incandescent light bulb in a low traffic area can last a significant number of years.

Year	Lighting Consumption per Household
2011	1025
2012	953
2013	882
2014	810
2015	738
2016	713
2017	689
2018	664
2019	640
2020	615

City of Los Angeles Climate Change Action Plan

The Mayor is upgrading all City buildings greater than 7500 square feet to meet a LEED green sustainability standard. Currently 49 percent of all municipal buildings meet the standard.

Forecasting Energy Efficiency

Incorporating energy efficiency targets into a load forecast is a very controversial undertaking. In fact the California Energy Commission (CEC) is sponsoring a Working Committee to resolve this issue. The expectation is that the Working Committee results will be available by Summer 2009.

In the Supplemental Forecast, LADWP adopts techniques developed at PG&E and SCE to forecast the energy efficiency impacts.

Energy efficiency savings potential comes from five sources:

1. Utility Programs
2. Naturally Occurring
3. Building and Appliance Standards
4. Market Effects
5. New Technologies

The State has made significant strides in energy efficiency since the first Oil Crisis that occurred in the 1970s. The historical savings from energy efficiency are embedded in the recorded sales of any utility. The problem becomes one of identifying how much savings have occurred in the past, what is the forecasted energy efficiency savings embedded in the forecasting models and how much additional savings will new programs add over the energy efficiency savings already embedded in the model.

Historical data regarding energy efficiency savings accomplishments is very weak. In 2006, LADWP changed its measurement standards and now reliable detailed data is being produced. However, to produce a forecast, one needs a longer historical data series.

LADWP estimates it accomplished the following savings since Fiscal year 2000-01 through its utility programs.

Fiscal Year Ending	Consumption (GWH)	Demand (MW
2001	65.0	32.6
2002	164.2	76.8
2003	52.3	19.3
2004	34.5	19.5
2005	37.0	16.2
2006	16.6	11.7
2007	67.9	15.5
2008	118.8	26.3

To establish the historical savings from sources other than utility programs, the data from the CEC forecast are used.

Table 31: LADWP Planning Area Electricity Conservation Savings Estimates

	1990	2000	2005	2008	2013	2018
Residential Energy Savings (GWH)						
Building Standards	228	289	310	331	356	385
Appliance Standards	209	679	919	1027	1160	1251
Utility and Public Agency Programs	31	53	34	25	31	33
Market and Price Effects	4	6	6	6	7	7
Total Residential Savings	472	1028	1269	1389	1553	1676
Commercial Energy Savings (GWH)						
Building Standards	149	355	523	660	890	1125
Appliance Standards	100	233	333	409	527	643
Utility and Public Agency Programs	36	8	1	0	0	0
Market and Price Effects	1049	1067	674	650	719	748
Total Commercial Savings	1334	1663	1532	1718	2137	2517
Total Energy Savings	1806	2691	2801	3108	3690	4193

Source: California Energy Commission, 2007

Notice that the practice is to only include the residential and commercial sectors in energy efficiency savings. These are the two largest sectors. Energy efficiency savings in the industrial sector is usually gained when a change is made in an industrial process.

These estimated historical savings are added to actual sales to forecast future load growth. The forecast is also run without the estimated historical savings. The two forecasts are netted to obtain the implied energy efficiency savings embedded in the forecasting model.

To find the additional savings from the AB 2021 targets, the embedded savings are subtracted from the AB 2021 targets. In the Supplemental, it is assumed that energy savings from EISA and the City of Los Angeles Climate Change Plan are also included in the AB 2021 targets. The reason for the inclusion is that the targets are set at the Maximum Achievable Scenario from the LADWP Energy Potential study.

The reader can now better understand the speculative nature of the forecast of energy efficiency savings in the Supplemental Forecast. The historical data is weak. Although the methodology is used by the Investor Owned Utilities in California, it is under review by a working group created under the auspices of the CEC.

Global Warming Solutions Act of 2006 (AB 32)

AB 32 codifies into law California's emission target. The emission target is to reach 1990 emission levels by 2020. In other words, thirty years of economic and demographic growth between 1990 and 2020 in the State will be emissions-free. One of the key strategies of AB 32 is for other sectors to export their emissions to the Electric Sector. For example, switching from a gas-fueled vehicle to an electric vehicle reduces emissions 50 percent. The Electric sector will then reduce these emissions even further through the use of renewable power. In the Forecast, there are new forecasts for load created by port electrification and plug-in hybrid electric vehicles in response to AB 32. These initiatives are both examples of the Transportation sector exporting their emissions to the Electric sector.

AB 32 could also impact land use. Land use impacts in the forecast are primarily reflected in the residential sector where the impact on electric consumption of the Mayor's strategic plan of building high-density .housing near transportation centers is forecasted.

Plug-In Electric Hybrid Vehicle (PHEV)

The Supplemental forecast adopts the CEC forecast for PHEVs through 2020. After 2020, we hold the number of PHEVs in the service area constant. The CEC actually has PHEVs growing rapidly after 2020 so that there is a PHEV in 85 percent of the households in the State by 2030. The State PHEV Forecast strikes us as optimistic. Currently there are competing technologies that may predominate over the PHEV technology such as standard hybrids and hydrogen-fueled vehicles. Also we could see the car as not being the predominant form of transportation if the change in land use policy makes public transportation more practical in Los Angeles.

Year	Number of PHEVs	GWH
2010	169	0
2011	1,181	2
2012	4,556	8
2013	9,137	16
2014	15,354	26
2015	23,792	41
2016	34,925	60
2017	49,616	85
2018	69,001	118
2019	94,580	162
2020	128,331	220
2021	128,331	220
2022	128,331	220
2023	128,331	220
2024	128,331	220
2025	128,331	220
2026	128,331	220
2027	128,331	220
2028	128,331	220
2029	128,331	220
2030	128,331	220

Port Electrification

The port electrification forecast is prepared by the Electric Power Group, a consultant, for the Port of Los Angeles.

Program	2008	2014	2020
AMP - (Clean Air Action Plan)	11	80	80
AMP - (New Cruise Terminal)		0	6
New Railyard - Electric Rail Cranes		27	27
New Railyard & Port Terminals - Electric RTGC		67	67
Electric Roadway Trucks - Fast Charger		202	252
Electric Rail - Container Movement System		28	140
Totals (GWH)	**11**	**404**	**573**

The Alternative Marine Program (AMP) receives most of the headlines but it is only 20 percent of the load increase. The majority of the load increase comes from cargo moving operations especially the Clean Truck program. The Clean Truck Program bans diesel-fueled trucks in the ports and replaces them with electric trucks. The Clean Truck program is an approved City program but it is now under litigation so forecasting the timing of the change is difficult.

Climate Change

Global Warming effects are not included in the Forecast. The research that we have reviewed is not specific enough to the LADWP Service Area to incorporate the effects into the Forecast. We have identified three potential effects of Global Warming to load.

1. Mean temperatures will continue to rise in Los Angeles increasing Cooling Degree Days (CDD) and decreasing Heating Degree Days (HDD).[4] If temperature grows linearly at the historical rate, it could potentially add 200 GWH to the load by 2030.
2. "Extreme heat conditions, such as heat waves and very high temperatures, may last longer and become more common place."[5] More frequent extreme heat conditions mean that we will more frequently encounter peaks that stress the Power System and pose a threat to the reliability.

[4] Climate Scenarios for California, California Energy Commission, CEC-500-2005-203-SF
[5] Global Climate Change, California Energy Commission, CEC-600-2005-007, page 2

3. Air conditioning saturation will increase with the rise of mean temperatures.[6] Increased air conditioning saturation will tend to lower the load factor of the system which is a more costly load to serve on a per kWh basis.

The Mayor's office has hired to UCLA to provide a weather forecast for the City based on the Climate Change Study performed at the State level. UCLA will telescope the State model into the LADWP service area. The work is expected to be done before July 2009. The weather forecast should be granular enough to use it in the October 2009 Forecast.

Conclusion

The State of California Energy Action Plan and AB 2021 Forecasts should be considered "transformational' in nature. Historically, when forecasts are transformational, it means that the future is more uncertain. Technological change is especially difficult to forecast. Technological change is integral to meeting AB 2021 and AB 32 goals. LADWP should be prepared to change plans as the future becomes clearer in focus as we move forward in time.

[6] Air conditioning market saturation and long-term response of residential cooling energy demand to climate change, D.J. Sailor, Energy 28 (2003) pages 941-951

Retail Sales Models

Tools

Metrix ND Software

References

Forecasting in Business and Economics by C.W.J. Granger
Statistics for Economists by Ralph E. Beals
Metrix ND Software Manual

Methodology

The Retail Sales Models are primarily econometric models using Ordinary Least Squares (OLS) Regression techniques. OLS Regression is a common technique. The methodology can be found in many texts.

Load Forecast uses Metrix ND software. The Metrix ND software was developed with the Power Industry sales forecasting groups as its target market. It was originally developed at EPRI. It performs OLS modeling and has other techniques available such as Arima models and Neural Networks. It is fully compatible with Window-type software which makes data manipulation easier. It produces a full set of statistics necessary for validating econometric models. Full documentation on use of the software is available on-line and in on-site manuals.

Residential Model Specification

Variable	Coefficient	StdErr	T-Stat	P-Value
Constant	-201.840	119.161	-1.694	9.27%
Billing Days	10.434	0.858	12.153	0.00%
Cooling Degree Days	0.261	0.014	19.064	0.00%
Heating Degree Days	0.177	0.017	10.659	0.00%
Cooling Degree Day Growth Index	1.114	0.247	4.518	0.00%
Heating Degree Day Growth Index	0.838	0.325	2.576	1.11%
Electric Prices	-766.633	471.024	-1.628	10.60%
Household Consumption	0.035	0.028	1.254	21.21%

Regression Statistics	
Iterations	1
Adjusted Observations	141
Deg. of Freedom for Error	133
R-Squared	0.924
Adjusted R-Squared	0.920
Durbin-Watson Statistic	1.721
Durbin-H Statistic	#NA
AIC	5.810
BIC	5.977
F-Statistic	231.780
Prob (F-Statistic)	0.0000
Log-Likelihood	-597.42
Model Sum of Squares	512362
Sum of Squared Errors	42001
Mean Squared Error	315.79
Std. Error of Regression	17.77
Mean Abs. Dev. (MAD)	13.83
Mean Abs. % Err. (MAPE)	2.42%
Ljung-Box Statistic	449.64
Prob (Ljung-Box)	0.0000
Skewness	0.114
Kurtosis	2.919
Jarque-Bera	0.3
Prob (Jarque-Bera)	0.7635

The dependent variable in this equation is sales plus historical energy efficiency per household.

The Growth Indexes essentially say that weather-sensitive cooling and heating load grow linearly with time. The technique was developed by Itron.

Forecasted Sales = Model Results* Households + Plug-in Electric Vehicle Consumption – EISA Lighting Load Impacts – AB 2021 Goals net of EISA impacts. Since LADWP

AB 2021 goals are the maximum achievable scenario based on the Energy Potential Study, it assumed that the EISA lighting impacts are a subset of AB 2021 load impacts.

Commercial Model Specification

Variable	Coefficient	StdErr	T-Stat	P-Value
Constant	-0.114	0.338	-0.337	73.70%
Billing Days	0.040	0.004	9.210	0.00%
Heating Degree Days	-0.000	0.000	-5.297	0.00%
Cooling Degree Days	0.001	0.000	12.128	0.00%
Electric Price	-3.612	0.471	-7.665	0.00%
Employment per Square Foot	0.529	0.156	3.386	0.09%

Regression Statistics	
Iterations	1
Adjusted Observations	141
Deg. of Freedom for Error	134
R-Squared	0.865
Adjusted R-Squared	0.858
Durbin-Watson Statistic	2.518
Durbin-H Statistic	#NA
AIC	-5.743
BIC	-5.596
F-Statistic	142.539
Prob (F-Statistic)	0.0000
Log-Likelihood	210.29
Model Sum of Squares	3
Sum of Squared Errors	0
Mean Squared Error	0.00
Std. Error of Regression	0.06
Mean Abs. Dev. (MAD)	0.04
Mean Abs. % Err. (MAPE)	1.92%
Ljung-Box Statistic	25.98
Prob (Ljung-Box)	0.3541
Skewness	1.172
Kurtosis	12.250
Jarque-Bera	534.9
Prob (Jarque-Bera)	0.0000

The dependent variable in this equation is sales plus historical energy efficiency load savings per square foot of commercial floorspace.

Forecasted Sales = Model Results* Floorspace + Port Electrification – AB 2021 Goals.

Industrial Model Specification

Variable	Coefficient	StdErr	T-Stat	P-Value
Billing Days	4139.151	535.602	7.728	0.00%
Cooling Degree Days	72.365	8.162	8.866	0.00%
Manufacturing Employment	0.169	0.033	5.172	0.00%
Electric Price	-2654.222	2913.825	-0.911	36.41%
Cogenerator Adjustment	6071.510	3835.156	1.583	11.59%
Binary.January1998	-31602.681	13558.079	-2.331	2.13%
Binary.February1998	42943.558	13513.469	3.178	0.19%
Binary.April2001	89975.283	13245.135	6.793	0.00%
Binary.March2004	-36257.737	13218.168	-2.743	0.70%
Binary.April2004	40764.046	13191.801	3.090	0.25%
Binary.July2004	21105.498	13174.124	1.602	11.17%
Binary.November2003	38135.278	13223.080	2.884	0.46%
Binary.November2004	55647.106	13168.268	4.226	0.00%

Regression Statistics	
Iterations	1
Adjusted Observations	141
Deg. of Freedom for Error	128
R-Squared	0.644
Adjusted R-Squared	0.611
Durbin-Watson Statistic	2.186
Durbin-H Statistic	#NA
AIC	19.045
BIC	19.317
F-Statistic	17.834
Prob (F-Statistic)	0.0000
Log-Likelihood	-1518.88
Model Sum of Squares	39646154940
Sum of Squared Errors	21888328107
Mean Squared Error	171002563.33
Std. Error of Regression	13076.79
Mean Abs. Dev. (MAD)	9322.71
Mean Abs. % Err. (MAPE)	4.54%
Ljung-Box Statistic	32.71
Prob (Ljung-Box)	0.1104
Skewness	0.499
Kurtosis	4.795
Jarque-Bera	24.8
Prob (Jarque-Bera)	0.0016

The dependent variable in this model is industrial sales. The binary variables are due large billing adjustments in the Industrial time series because of the size of customers. The cogeneration adjustment is due to increased load when LADWP signed a contract with a customer to serve their load in lieu of them operating their cogeneration unit.

Intradepartmental Model Specification

Intradepartmental sales are primarily related to amount of water pumping by the Water System. Water pumping is primarily related to rainfall. The Forecast is simply the long-term annual mean usage by the Water System. The long-term mean usage is 150 GWH per year. The annual average is distributed to the months based on historical patterns.

Streetlight Model Specification

Streetlight sales are not metered. The sales are estimated by counting the number of streetlight lamps on the system, using the energy rating of the lamps and assuming a load shape. Because the replacement lamps are more energy efficient, the trend is that sales are falling over time. The forecast is based on a simple time trend.

Owens Valley Model Specification

For forecasting purposes, all Owens Valley sales are rolled into a single class. It is a slow growth area. The forecast is a simple time trend. The sales are distributed to the months based on historical patterns. There was a significant shift upward in sales in 2005 due to a reclassification of load from Purpose of Enterprise to Intradepartmental Sales.

NEL Forecast

The NEL forecast is a function of the Retail Sales Forecast. In the long-run, the average Loss-to-NEL ratio is 11.5 percent. The 11.5 percent ratio has been remarkably stable over a long period of time. To forecast annual NEL, we divide the annual Retail sales forecast by .885 to maintain the 11.5 loss ratio. There is an adjustment for the reclassification of sales in the Owens Valley forecast. The annual NEL is allocated to the months based on historical patterns. Since NEL is based on calendar month there is a leap year adjustment.

Peak Demand

LADWP assumes that the annual Peak Demand will occur on the fourth Thursday of August. Historically, 40 percent of all annual peaks have occurred between August 15 and September 7. The majority of the rest of the peaks have occurred in the summer months June, July and the first half of August. There have been two annual peak outliers - one each in April and in October.

The Peak Demand Forecast is built around a temperature response function. The function is non-linear because as daily temperatures increase the demand for electricity increases at varying rate. The estimators in ordinary least square (OLS) regression are linear which does not fit with the non-linearity of the temperature response function so the spline method is used to estimate the function. In the spline method, the function is divided into segments. For each segment, we use the linear OLS techniques. The splines are spliced together to create the non-linear curve.

<u>Peak Demand Model Specification</u>

Variable	Coefficient	StdErr	T-Stat	P-Value
Mean Temperature <= 75	58.277	7.135	8.168	0.00%
75< Mean Temperature <= 80	62.677	6.211	10.092	0.00%
80< Mean Temperature <= 85	73.295	5.327	13.758	0.00%
85< Mean Temperature <= 90	47.645	6.625	7.192	0.00%
90< Mean Temperature <= 95	67.088	10.409	6.445	0.00%
Mean Temperature > 95	70.001	29.475	2.375	1.79%
Month_Variables.Jun	3701.148	29.783	124.270	0.00%
Month_Variables.Jul	3743.235	35.992	104.003	0.00%
Month_Variables.Aug	3746.068	35.807	104.619	0.00%
Month_Variables.Sep	3696.662	32.538	113.610	0.00%
Year_Variables.Year2002	-334.710	24.260	-13.797	0.00%
Year_Variables.Year2003	-241.870	26.222	-9.224	0.00%
Year_Variables.Year2004	-171.893	24.083	-7.137	0.00%
Year_Variables.Year2005	-274.187	23.790	-11.525	0.00%
Year_Variables.Year2006	-206.476	24.618	-8.387	0.00%
Year_Variables.Year2007	-129.223	23.660	-5.462	0.00%
Minimum Temperature < 60	66.461	4.457	14.911	0.00%
Minimum Temperature < 65	40.104	10.899	3.680	0.03%
Minimum Temperature > 65	101.068	29.334	3.445	0.06%

Regression Statistics	
Iterations	1
Adjusted Observations	572
Deg. of Freedom for Error	547
R-Squared	0.923
Adjusted R-Squared	0.920
Durbin-Watson Statistic	1.176
Durbin-H Statistic	#NA
AIC	10.099
BIC	10.289
F-Statistic	263.639
Prob (F-Statistic)	0.0000
Log-Likelihood	-3674.93
Model Sum of Squares	153573427
Sum of Squared Errors	12745392
Mean Squared Error	23300.53
Std. Error of Regression	152.65
Mean Abs. Dev. (MAD)	103.71
Mean Abs. % Err. (MAPE)	2.39%
Ljung-Box Statistic	112.61
Prob (Ljung-Box)	0.0000
Skewness	1.069
Kurtosis	20.923
Jarque-Bera	7764.9
Prob (Jarque-Bera)	0.0000

The mean and minimum temperature variable is a weighted average of Civic Center (50%), Woodland Hills (30%) and LAX (10%). We use mean temperature because of lack of historical data on humidity. CEC found mean temperatures a reasonable proxy to measure humidity effects.

The dependent variable in the model is weekday peak demand. The maximum weekday daily demand occurs between 1500 and 1600 hours. Splines are created each 5 degrees of the temperature variable. The model only includes weekday data for the months June through September. LADWP does not have a significant winter peak so we only model summer demands. The year variables adjust for sales growth. June and September tend to have lower weather response than July and August.

Using the above model assuming a test year, daily peak demands are forecast using historical simulation. In the historical simulation we ignore weekday effects and assume the event occurs in August. From the daily peaks, we cull the annual peaks. It yields a sample of 43 observations. The mean and standard deviation are calculated from the sample of annual peaks. It is assumed that the normal distribution is an efficient unbiased estimate of the true distribution of annual peaks based on the Central Tendency theorem.

The peak demand for the test year is the mean of the sample and corresponds to the fiftieth percentile of the normal distribution derived from the sample of annual peaks. The 1-in-5, 1-in-10 and 1-in-40 forecasted peaks correspond to the eightieth, ninetieth and the ninety-seventh and one-half percentiles respectively. To forecast peak demand from the test year, we grow the peak demand at the rate of NEL growth. That peak demand will grow at the rate of NEL growth is a simplifying assumption. In fact, we expect the energy efficiency programs will improve system load factor over time. However, since some the energy efficiency savings is derived from undefined programs, it is not possible to forecast changes in load factor at this time.

Hourly NEL

Monthly Peaks and Minimum Demand Forecast Methodology

The annual peak demand is forecasted to occur in August of each year. LADWP also forecasts peaks and minimum demands for each calendar month. The method is fairly simplistic. We calculate load factors for each month since 1980. The load factor is calculated separately for the maximum and minimum peak. For the historical load factors, we then calculate the mean load factor for each month for both the maximum and minimum. To calculate the forecasted peaks and minimum demands, we multiply the mean load factors times the forecasted NEL for that month. To check the work, trends are calculated and results are evaluated for reasonableness. Small adjustments may be made based on the analysis.

8760 Hour Forecast Methodology

The Energy Production models require that Load Forecast produce an hourly forecast. 8760 hours refers to the number of hours in the year not including leap years.

The LOADFARM algorithm developed by Global Energy Decisions is used to create the forecast. The LOADFARM documentation is available upon request.

There are four inputs into the LOADFARM algorithm:

- Monthly NEL
- Monthly Peak Demand
- Monthly Minimum Demand
- 8760 Load Shape

The load shape is created using a ranked average procedure. The ranked-average procedure preserves the extremities in the data better than would a simple average. We take a historical sample of annual load shapes. Currently the sample is from calendar year 2002 forward. The reason is that we do not what to include pre-California Energy Crisis data in the shape. The historical data is permutated so that all the peaks line up on the fourth Thursday in August. We average the NEL across the hours and assign each hour a rank 1 through 8760. This ranking creates an index. Next we rank each year in the study 1 through 8760 and average the NEL across the rankings. The ranked-average NEL is assigned its spot according to the index.

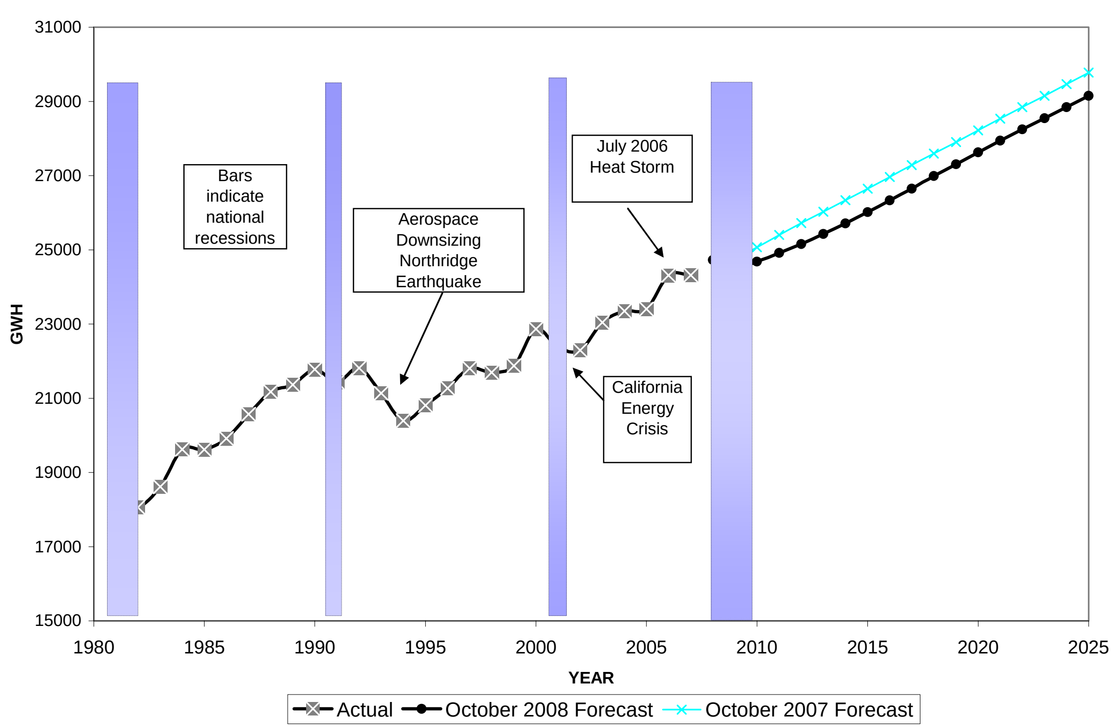
Plausibility

To meaningfully measure growth rates, it is important to use years that exhibit similar behavior in the economic cycle as benchmarks. Historically, we use Fiscal Years 1980-81, 1990-91, and 2000-01 as benchmarks. We believe that Fiscal Year 2008-09 will also serve as a benchmark in the future. These years represent time periods when national economic expansions were turning into recessions.

Because the Forecast is so influenced by programs we use the unmitigated forecast which does not have the load impacts from energy efficiency objectives, plug-in hybrid electric vehicles and port electrification included. The unmitigated forecasted growth rate for Retail Sales in the ten-year period following 2008-09 is 0.9 percent excluding savings from energy efficiency. Historical Retail Sales grew 2.1% annually in the ten years following 1980-81 - a boom period for commercial building - and 0.6% in the ten years following 1990-91 when Los Angeles faced a multitude of problems including a major civil disturbance, earthquakes, and a severe contraction of the Aerospace-Defense industry. Since 2001 sales have grown at a 1.0 percent rate with the majority of the gain occurring in 2006. Given the potential severity of the 2009 recession, the Traditional Forecast is rightly below the 2001-2008 actual growth rate and the October 2007 Forecast.

Based on these historical comparisons we conclude that the Retail Sales growth rates in the Forecast are plausible.

Historical and Forecast Growth Rates



Time Period	Growth Rate	Average Annual Growth (GWH)
1981-91	2.1%	408
1991-01	0.5%	113
2001-09	0.9%	208
2009-19	0.5%	253
2009-29	0.7%	281

Form 5 Committed Demand-Side Program Methodology

Efficiency Program Costs and Impacts

The actual and estimated load impacts provided are consistent with energy savings estimation methodologies approved by the State of California and used by both Investor Owned Utilities (IOU) and Publicly Owned Utilities (POU) for Energy Efficiency program reporting purposes. The LADWP uses the *E3 reporting tool* developed by Energy and Environmental Economics, Inc., designed to provide utilities with a uniform way to present data on load impacts as well as document the cost effectiveness of implemented and planned programs. LADWP submits its annual efficiency program impacts and projections to the State Energy Resources Conservation and Development Commission through a collaborative reporting with the Southern California Public Power Authority (SCPPA) and the Northern California Power Agency (NCPA) member utilities in accordance with the requirements and provisions of Assembly Bill 1037.

Energy savings, peak demand reduction estimates and cost data used in the E3 tool are derived from various sources including but not limited to, Database for Energy Efficient Resources (DEER), KEMA, IOU and POU work-papers. For measures not available in the E3 tool, LADWP utilizes savings calculations using industry standard practice methodologies. Net-to-gross (NTG) ratios used to convert gross measure or program impacts into net impacts as well as the assumptions used for “measure life” are included as part of data input in the E3 spreadsheet program.

LADWP continues to fund its demand side management programs using Public Benefits Budget allocated for such purposes and through adjustments in the LADWP’s Energy Cost Adjustment Factor (ECA) as provided for in the Rate Ordinance.

Demand Response Program Costs and Impacts

The estimated response program costs and impacts as shown on form 3.4 have been prepare in accordance with definitions and guidelines as specified in the Forms and Instructions for Electricity Demand Forecasts of the California Energy Commission (CEC) Report. The demands were based on various sources including customer billing history, and previous CEC Integrated Energy Policy Reports (IEPR).

1. Alternative Maritime Power (AMP) Program

LADWP Alternative Maritime Power (AMP) is a program that may interrupt energy usage resulting from Merchant Ships located at the Port of Los Angeles. LADWP may remotely interrupt any AMP load under this service with thirty minutes of advanced notice.

2. Thermal Energy Storage (TES) load-shifting Program

The estimated load impacts provided are based on standard practice engineering calculations for Thermal Energy Storage (TES) load-shifting demand impacts. Since this is a demand load-shifting program rather than an energy saving initiative, energy savings have not been included for this submittal. Program costs shown, predominantly are comprised of the incentive amounts for the installation of the TES systems.

LADWP continues to fund its TES Program through adjustments in the LADWP's Energy Cost Adjustment Factor (ECA) as provided for in the Rate Ordinance.

Renewable and Distributed Generation Program Costs and Impacts

It is assumed that all LADWP solar programs are committed as they are goals of the Los Angeles Mayor. The estimates for energy and peak impacts for LADWP's Customer Solar Incentive program are determined with the following assumption:

- LADWP has a goal of encouraging customers to install 130MW of solar projects by the end of 2016. These projects will be customer owned and net metered with incentive payments from LADWP as directed by SB1. These projects are expected to produce 1650MWh/MW installed and LADWP's incentive payments are expected to total about $207 million. The program is expected to grow about 30% annually with the expectation that the solar industry will be dramatically reducing installed costs to meet this growth.

The programs assume drastic reductions in solar equipment and installation costs. Average installation prices today are in the $8-10/watt range for traditional PV installations. As is shown above, LADWP expects, based on industry claims and independent industry assessments, that these costs will be reduced by 50% or more over the next several years. It is also expected that access to a portion of the significant tax benefits will be made available to municipal utilities.

Form 6 Uncommitted Demand-Side Program Methodology

Efficiency Program Costs and Impacts

Assembly Bill 2021 which became law in 2007 requires California Utilities to identify energy efficiency potential and establish annual efficiency targets that would result in the state meeting its energy efficiency goals. As mandated by the bill, LADWP is required to conduct an efficiency potential study every three years in order to establish and continuously update its efficiency goals and projections

An energy efficiency potential study was conducted by Quantum Consulting (Now Itron) and completed in February 2006, the results of which eventually became the basis for the energy savings and projections as shown in this submittal (an update of the study is due in 2010.) ***The same methodology used for the committed programs applies in determining the corresponding amounts of peak demand and energy saving impacts.***

Demand Response Program Costs and Impacts

1. Experimental Real-Time (XRT) Program

LADWP Experimental Real-Time pricing service (XRT) is experimental and is limited in the number of customers receiving this service. The service requires customers to reduce load during an Alert Period Notification. This may include, but not limited to, high system peaks, low generation, high market prices, temperature, and system contingencies. This notification to reduce load is voluntary in nature, but LADWP may force customers to use a higher price service rate if customers do not voluntarily reduce load.

2. Thermal Energy Storage (TES) load-shifting Program

The same methodology used for the committed programs applies in determining the corresponding amounts of peak demand saving impacts.